Construction and Maintenance

Engineering and Highway Departments

A 22-Mile Brick Highway Between Canton and Akron, Ohio

THE entire distance between Canton and Akron, Ohio, 22 miles on State Route No. 8, is now paved with a brick surface 40 feet wide, laid on a concrete base. Four traffic lanes of the standard width of 10 feet each will permit the speedy handling of the heavy bus, truck, and passenger motor transportation existing between these two important industrial centers. All curves have been banked with the idea of providing for speed with safety, and the maximum grade is 5 per cent. Traffic officials of the State Highway Department figure that the new super-highway will immediately become one of the heaviest-traveled roads in the state.

Ohio State Highway No. 8 starts at Cleveland and runs to the Ohio River, passing through such centers as Akron, Canton, New Philadelphia, Dennison, Uhrichsville, Barnesville, Woodsfield.

The contract for this new highway was let in April, 1931, to the Cleveland-Trinidad Paving Co., of Cleveland, Ohio, at a cost of $1,000,000. In the effort to complete the road by September 1, in order to make use of the Federal Aid money set aside to provide work to the unemployed, there were times when two shifts of eight hours each were on the job. The first shift started at 4.00 A. M. and worked until noon, and the second shift from noon until 8.00 P. M. Elaborate ceremonies marked the opening of the highway on Friday, September 4, 1931.

Vertical fiber brick with lugs were used on this highway. This brick differs from the wire-cut lug brick in that the wire-cut, instead of the die, side is laid upwards or in the surface of the pavement. This provides an additional non-skid feature to the finished pavement.

Michigan Has 60,317.5 Miles of Township Roads

THE Michigan State Highway Department completed a tabulation showing that there are 60,317.5 miles of township roads in the state, not including those roads in the state and county highway system running through the townships. This tabulation was the first step toward putting into operation the statute passed by the 1931 Legislature under which the counties will take over the maintenance of all township roads, beginning with 1932, at the rate of 20 per cent each year for five years.

Under the statute, $2,000,000 is to be divided among the 83 counties from the state gasoline tax on a basis of township road mileage in 1932, and an additional $500,000 each year until 1936, when a total of $4,000,000 will be distributed, and this figure will be continued thereafter, according to the *Michigan Municipal Review*. The 20 per cent, or 12,063 miles, will permit the expenditure of $165.80 the first year, down to $66.32 the last year.

New Bridge at Petoskey, Mich., Recently Dedicated

ON Armistice Day one of the most beautiful bridges in the Michigan state highway system, over Bear Creek valley at Petoskey, was dedicated. The new bridge replaced an old structure which consisted of five 60½-foot deck truss spans and one 30½-foot I-beam span, with short approach spans at each end of the bridge, making a total over-all length of about 357 feet. The old structure had one masonry pier and masonry abutments, the other piers being of light steel frame construction. The roadway was surfaced with asphalt plank and had a width of 19 feet, and two 7-foot sidewalks were provided. The old structure was light, had a narrow roadway, and was inadequate for present loading and in poor condition. It was therefore found necessary to replace it with a modern bridge providing adequate strength and roadway facilities.

The new structure consists of seven spans with a total over-all length of about 265 feet, spanning the valley containing the city park and Bear Creek, below the city power plant. The structure provides a 40-foot roadway and two 6-foot sidewalks. The construction is entirely of reinforced concrete, the superstructure being of the reinforced concrete T-beam type with special outside girders formed to the shape of Tudor arches. The piers are the reinforced concrete skeleton type, and the abutments are all of reinforced concrete with special curved wingwalls.

As this project is located within the City Park and in a town where the tourist element is a very important consideration, special attention was paid to esthetics in the design of the structure. A concrete spindle railing was provided and bush hammered panels were used on the abutments and wingwalls and on the outside faces of the pier columns. The ornamental lighting standards were furnished and placed by the city of Petoskey, the state furnishing and placing the conduit to provide access to them.

The contract for the construction of this bridge was awarded to the Whitney Brothers Co., of Detroit, which later combined with Merritt and Chapman to form the Merritt-Chapman and Whitney Corporation. Construction was started in the middle of December, 1930, and clean-up was completed September 5, 1931. The cost of the structure was approximately $132,500.

Resurfacing with a Hot Pre-Mix, Using Asphalt Emulsion

DURING the past summer the Maintenance Department of the city of Oakland, Calif., used about 200 tons of fine and coarse hot pre-mix, using Bitumuls as the binder. Batches of 1,500 pounds were made at the asphalt plant of the Heafey-Moore Paving Co. The rock and sand were trapped from stockpiles to the revolving dryer, which heated the aggregates to about 200 degrees Fahrenheit. The hot aggregates were elevated and screened to the bins above the mixer, from which they were batched into the revolving pug mixer, just as for hot asphaltic concrete. The weighed amount of Bitumuls was then batched into the aggregate and mixed for from 45 to 60 seconds. Considerable vapor arose during mixing, and the temperature of the mix was somewhat reduced by the cold asphalt emulsion.

The resulting mixture flowed into the trucks as readily as though it had been uncoated. One hundred fifty tons of the mixture was spread half-width on Grand Avenue and on 45th Avenue, which were barricaded during the spreading and rolling. The base was an old asphalt macadam, which had been smoothed by planing, which also removed excess oil from the surface. Fifty tons was also used to surface the City Yard.

The mixture spread readily from the end gate of the trucks and would have handled well through spreading boxes. The loads left the truck beds shiny clean. After a continuous section of street had been covered a one-man grader was used to blade the mixture to uniform cross-section about 1 inch in thickness. The grader blade handled the mix easily, and during the spreading men with shovels filled low places and reduced elevations here and there. The mix was rolled immediately after spreading.

When first spread, the mixture had a brownish color, and during rolling it gradually turned black and a sticky period was reached, at which time the roller wheels were wetted to prevent pick-up. The asphalt film did not strip from the rock at any stage. A light covering of sand would have hastened the time of opening the street to traffic, after the rolling.

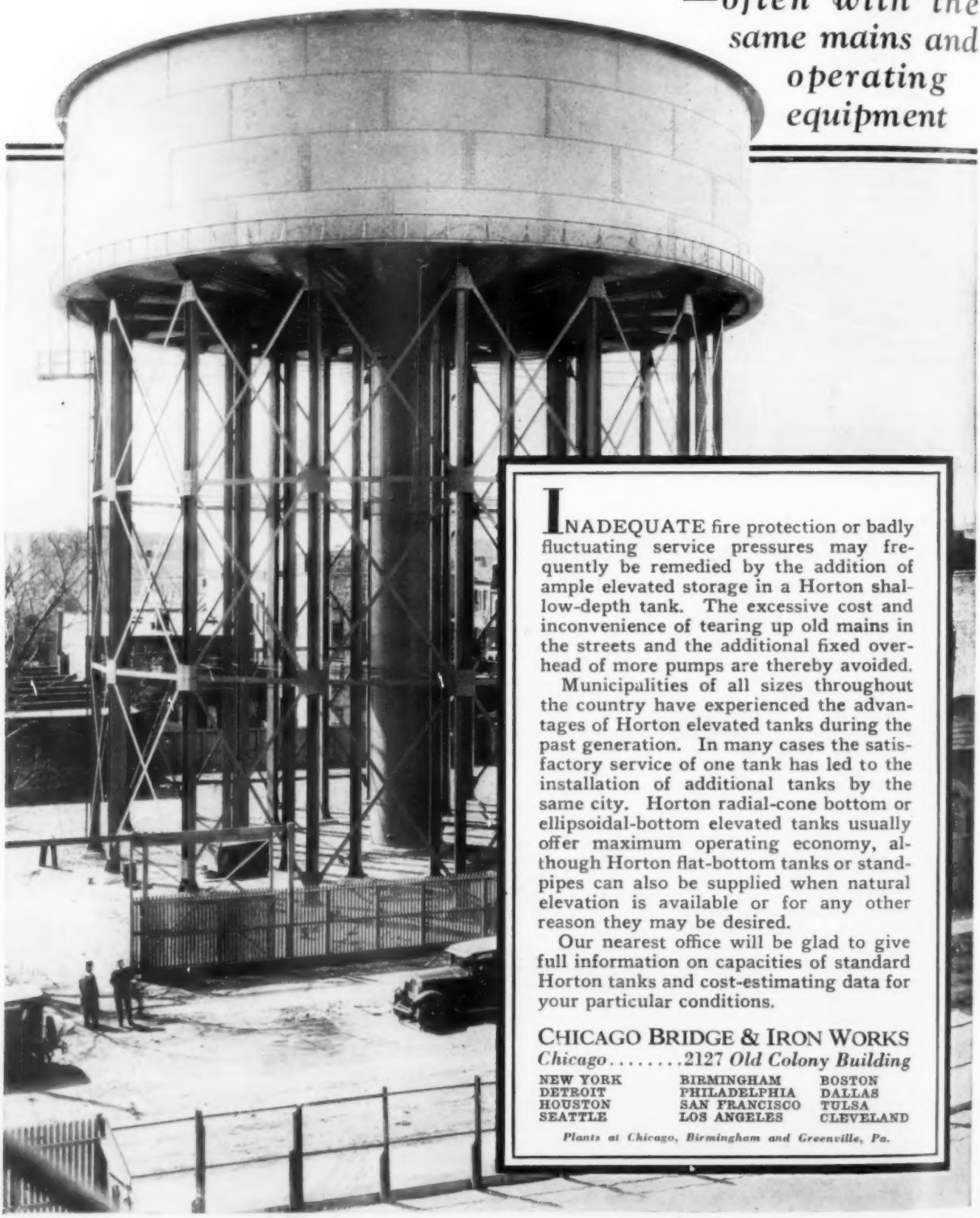
The mixture dumped at the City Yard was bladed the next day and was handled as readily as the material that was mixed the same day.

WALTER N. FRICKSTAD,
City Engineer.

HORTON TANKS

Improve Municipal Water Service

—often with the same mains and operating equipment



INADEQUATE fire protection or badly fluctuating service pressures may frequently be remedied by the addition of ample elevated storage in a Horton shallow-depth tank. The excessive cost and inconvenience of tearing up old mains in the streets and the additional fixed overhead of more pumps are thereby avoided.

Municipalities of all sizes throughout the country have experienced the advantages of Horton elevated tanks during the past generation. In many cases the satisfactory service of one tank has led to the installation of additional tanks by the same city. Horton radial-cone bottom or ellipsoidal-bottom elevated tanks usually offer maximum operating economy, although Horton flat-bottom tanks or standpipes can also be supplied when natural elevation is available or for any other reason they may be desired.

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Pure Water—Man's Greatest Need

Items on Water Supply and Purification

Treatment Overcomes Badly Polluted Supply

THE water supply for Kelso, Wash., is taken from the Cowlitz River. In spite of the fact that this supply is badly polluted, samples taken from the filtration plant and the reservoir and in South Kelso, and tested by H. W. Nightingale, State Sanitary Engineer, were pronounced very satisfactory.

Samples of the city water are inspected by the State Sanitary Engineer each month, and the report for the period ending July 21, 1931, was one of the most satisfactory ever received, even though it was made at a time when many cities are experiencing trouble with their supplies.

The present water purification plant was installed in 1924 and is equipped to handle the treatment of a much larger amount of water than that required by the present population.

LUCIEN B. CRAWFORD.
Superintendent of Water Works.

Pollution of Reservoirs by Birds

IN Massachusetts there has been considerable agitation lately among those charged with maintaining the purity of surface supplies, on account of the hazard of pollution of open reservoirs by birds, and particularly by sea-gulls. On February 12, 1931, the Governor of Massachusetts signed a bill legalizing the shooting of gulls over water supply reservoirs in order to preserve the purity of the water.

The pollution of reservoirs by seagulls and other birds has been recorded at various other points in the United States and in Canada, Great Britain and Central America. In San Francisco, it was necessary to cover one of the distributing reservoirs in 1919, and all reservoirs built since that time have been covered. At Los Angeles during the fall it is a common occurrence for 10,000 or more gulls to rest on one of the reservoirs at night. The best results in protecting the water supply have been obtained by shooting at the birds to drive them from the lake.

In New York City, from the end of August until the following April, seagulls flock to Hillview Reservoir, at times numbering thousands. The effect of the gulls on the pollution of the supply has been evident in the late summer and fall, as shown by the average B. coli content during this period in comparison with the remainder of the year when the gulls are not present. The Metropolitan Water Board of London, which has had considerable difficulty with gulls, estimates from the results of a practical test that each gull may contribute 50 to 100 million B. coli per day to a water works.

In England some three years ago the typhoid bacillus was isolated from gulls' excreta collected in the vicinity of a town where typhoid epidemics occurred. In this way, the possibility of the spreading of typhoid fever by gulls which pollute water-supply reservoirs was demonstrated. From an esthetic standpoint, it is also desirable to keep gulls away from reservoirs, for people do not like to think that they are drinking water polluted by birds which may have been feeding in the vicinity of sewer outlets. It should therefore be made lawful in other states to shoot gulls in order to prevent large flocks of these birds from lingering in the vicinity of reservoirs.

—From a paper by G. C. Houser, Assistant Engineer, Metcalf & Eddy, Boston, Mass., in the *Journal* of the New England Water Works Association.

Water Rates, or Taxes?

UNDER the title, "——about Higher Water Rates," the Buffalo Municipal Research Bureau, Inc., Buffalo, N. Y., discusses the very interesting situation of the Division of Water in Buffalo, which is a part of the Department of Public Works. The functions of the Public Works Department relate to sewers, streets, bridges, harbor, public buildings and similar public undertakings, whose construction, operation and maintenance are paid for by money obtained immediately or ultimately through taxation.

The Division of Water is practically a public utility business whose total annual cost of some $2,500,000 is paid by consumers through their water bills, and it occupies a peculiar position in the governmental system of Buffalo. Its rates are intended to make it self-sustaining. It carries on its work, makes improvements and extensions, and pays the principal and interest on its bonded debt from its own earnings. Except that it is expected to make no profit, it is a public utility, as is the Buffalo General Electric Co., and the Iroquois Gas Corporation. During the past three years, however, the Division has made a profit totaling $258,700.

In its work, a Division of Water requires a special type of technical and business management, and in many, perhaps in most, cities the water service is a separate department. Placing the water service in the general group of public works disassociates it from the importance it actually possesses.

Under the charter previous to the present one in Buffalo, the water-works revenues were devoted solely to the expenditures of the water service. Although organized as a part of the Public Works Department, it was financially separate. The present charter did not confirm this financial separation, and, taking advantage of this, the revenues since 1928 have been treated in the same way as are such other city revenues as state aid, licenses, etc., and used to reduce the general city tax; with the result, at times, that the tax has been kept within the constitutional limit only by this means. The accounting process by which this is accomplished is too complicated to explain here, but the effect is that the water users, having once paid the full cost of the service in their water bills, pay another $1,250,000 each year in their general city tax bills to pay for operating the Water Division.

A proposal was presented to the Common Council to increase rates on certain users of the water service by about 50 per cent. The increase is to be charged to those on metered service only. The chief argument offered to justify any increase in rates is the proposal of the Department of Public Works to set up a reserve for depreciation of plants and equipment, of $300,000, to be added to the $2,366,832.57 which covers the operation and maintenance, interest and principle on bonded debts for 1932-33.

A reserve for depreciation has never before been proposed for the Buffalo water-works plant. No such reserve is now, or ever has been, set up by the city for any other property. The water-works plant, including pipe extensions, is provided for through bond issues, and the consumers of water during the life of those bonds pay off the entire bond issue and interest. A reserve for depreciation would have the effect of compelling the "present generation" of water consumers to pay not only for the plant which they now use, but to provide a plant free of cost for the next "generation." Such is the accounting theory of the depreciation reserve.

The Buffalo Municipal Research Bureau summarizes its attitude as follows:

1. No increase in water rates to any class of consumers is needed, as the Division is self-sustaining at present rates.

2. The present rates were scientifically made and any further adjustments should be made only after an expert study by competent water engineers.

3. The annual abstraction of about $1,250,000 from water revenues to benefit the general city funds is a rank injustice.

4. To levy on the present generation of water consumers a charge for a reserve for depreciation is unprecedented, unwarranted, and, considering what this generation is now bearing, intolerable.

5. The Division of Water should be made financially independent of other city service.

6. The Division of Water should be an independently organized department.

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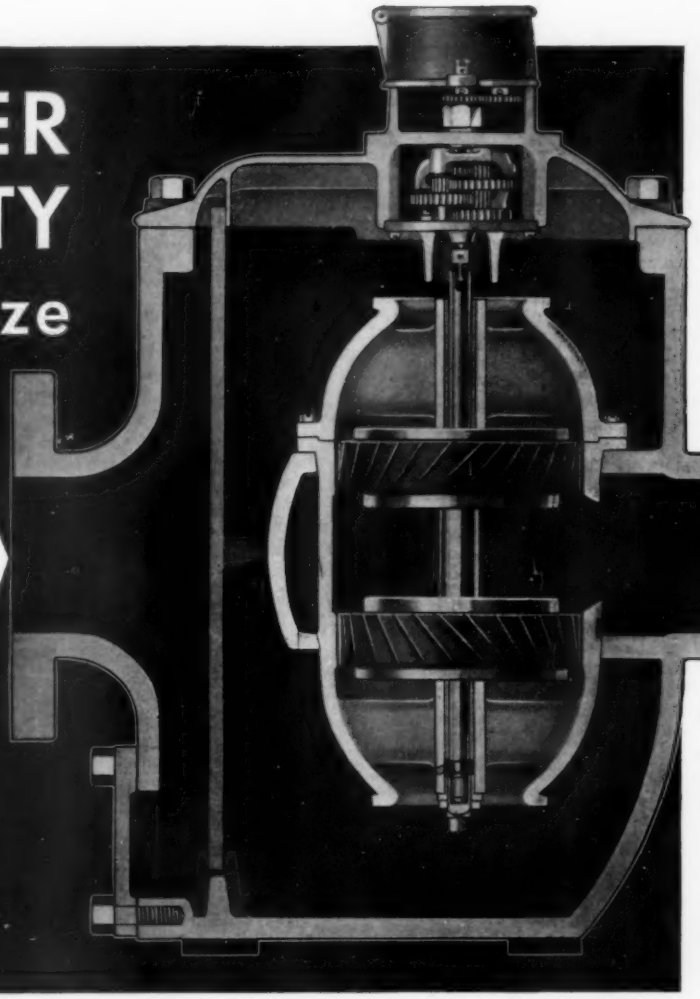

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For heavy service such as railway standpipes, water supply mains, pump station meters, hydraulic elevators and the like, there is the Badger Turbine—a meter of greater capacity — a meter that shows the minimum loss of line pressure on largest water volumes. And now, as a new and added feature, a special Volume and Pressure Recorder is available.

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BADGER Water METERS

During March we hope you will remember to mention THE AMERICAN CITY

W. G. MIDDLETON
Supt., Public Service Commission, Yazoo City, Miss.
(Appointed 1920)

J. S. BOWKER
Water Commissioner
Kearney, Nebr.
(Appointed 1923)

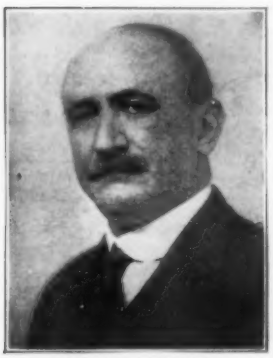
MILTON SEAMAN
Supt., Water Department
Greeley, Colo.
(Appointed 1913)

F. T. SCHULTZ
Supt., Light and Water
Columbia City, Ind.
(Appointed 1907)

E. J. VAN FOSSAN
Supt., Light and Water Plant
East Palestine, Ohio
(Appointed 1928)

Who's Who in Water Supply

The 50th of a Series of Portraits of Water-Works Officials Which Has Appeared Monthly Since January, 1928



ALVIN BUGBEE
Supt., Water Department
Trenton, N. J.
(Appointed 1904)

FRED J. SHARKEY
Supt., Water Department
Wenatchee, Wash.
(Appointed 1925)

WALTER R. BRACKEN
Vice-Pres., Las Vegas Land & Water Co., Las Vegas, Nev.
(Appointed 1906)

WILLIAM H. VAUGHN
Water Commissioner
Fort Smith, Ark.
(Appointed 1927)

SIG RAVNOS
Supt., Water Works
Mandan, N. Dak.
(Appointed 1928)

CARL A. McCLAIN
Supt., Water Board
Eugene, Ore.
(Appointed 1918)

JOHN H. GRIFFIN
Supt., Water Works
Trinidad, Colo.
(Appointed 1925)

ALEXANDER LINDSAY
Supt., Water Department
Spokane, Wash.
(Appointed 1910)

J. C. SCALLIN
Supt., Water Works
Mitchell, S. Dak.
(Appointed 1927)

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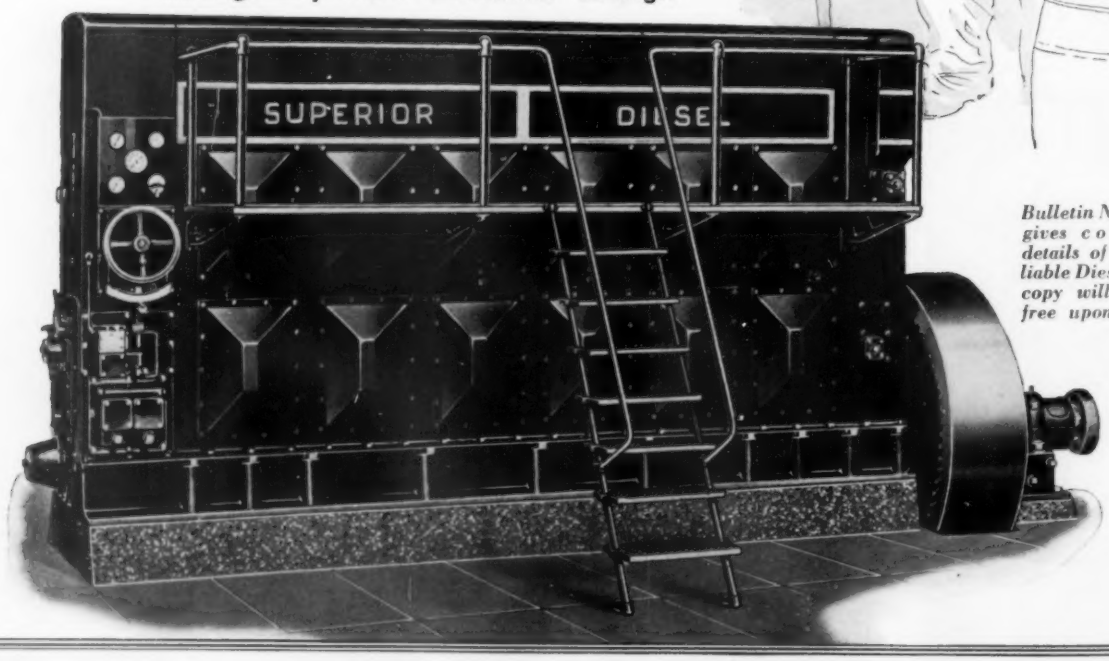

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Tests and Analyses Necessary at Sewage Works—II

Dewatering of Sludge on Drying Beds

When sludge is dewatered on sludge beds, the volume of sludge applied, depth of application, time of drying, number of applications per year, weather conditions and volume of dewatered sludge should be determined. Records of sludge-bed operation should include the percentage of solids in the sludge as applied and removed.

Mechanical Dewatering of Sludge

Where sludge is dewatered by mechanical means, it is important to make tests of sludge density, or solid content, and reaction, or pH value, checked by rate-of-filtration tests in connection with the conditioning of the sludge for dewatering. The rate of dewatering by filtration of the sludge and the yield of cake are important. Determinations of the water and the solids in the dewatered sludge should also be made. When sludge is dried and prepared for fertilizer, the determination of its mechanical composition, percentage of moisture and of the total and available nitrogen and other fertilizing constituents is important.

Treatment of Sewage Containing Industrial Wastes

Where industrial wastes or sewage containing abnormal quantities of industrial wastes are treated, analytical determinations and tests, in addition to those previously mentioned, may be required, such as color, fat, alkalinity or acidity, iron, copper, lead, zinc, aluminum, calcium, magnesium, sulphates and sulphides, depending on the kinds of industrial wastes present.

Effect of Discharge of Sewage or Effluent on the Receiving Waters

In many cases, especially where there is a possibility of litigation, tests should be made to determine the effect of the discharge of sewage or sewage effluent at different points on the receiving waters. These tests should ordinarily include color, suspended solids, dissolved oxygen, and relative stability or biochemical oxygen demand. The presence of sludge banks should be noted. Periodic determinations of the number and kinds of plankton in the receiving waters may be desirable. In cases where the receiving waters are used for water supply, bathing or shellfish culture, bacteria counts and B. coli tests should be made. The time, extent and frequency of such tests will depend upon local conditions. In certain instances, particularly in tidal waters and lakes, studies should be made of the currents where sewage effluents are discharged. A knowledge is desirable of the dilution afforded by the receiving waters, particulary during the summer when temperatures are high and stream flows are at a minimum.

Importance of Sampling

For comparative and analytical determinations and tests, it is of the utmost importance that the samples be truly representative. In order to obtain representative composite samples, individual samples should be taken at frequent intervals and in proportion to the sewage flow. Determinations of chlorine in the form of chlorides are of assistance in indicating to what extent the samples are comparable.

Laboratories

In order to perform the necessary analytical determinations and tests, it is essential that suitably equipped laboratories should be provided. The larger plants will require complete equipment for making analytical determinations and tests needed for research investigations, as well as for a record of accomplishment. In the case of small plants, it may be sufficient to provide equipment only for the tests required to control the operation. Where local laboratories are not available, control samples should be collected at regular intervals and analyzed by the technical supervisor.

Influence of Local Conditions

It is impossible to stipulate just what analytical determinations and tests should be made at every sewage treatment plant. Local conditions will often govern. The analytical determinations and tests suggested in this report of a committee of the Sanitary Engineering Division, American Society of Civil Engineers, may be considered generally applicable. Other determinations and tests will be required in special cases. In all instances it is desirable to record the temperatures of the sewage, effluents and sludges, in order to compare the results in different localities. Sufficiently complete analyses of the sewage should be made to determine its general character and composition.

Sewer Construction Program in San Francisco

THE San Francisco sewer system is what is known as a combined system, in which the domestic sewage and the storm water are carried in one conduit. The sewers are planned to carry to the outfalls all sewage, all infiltrated water, and run-off due to rainfall of ¼-inch in 24 hours. If the rainfall exceeds ¼-inch, which is usual about 26 days per year, the excess run-off due to the storm is diverted through storm-relief outlets to flow through shorter relief sewers into the bay or ocean. The sewage in these relief outlets is so diluted by the storm run-off that it is unobjectionable at the points of storm-water discharge. There are a number of relief outlets on the North Point main, one of which consists of three compartments 8 feet 3 inches x 9 feet 6 inches.

The sewer system consists at present of about 97 miles of trunk sewers built by the municipality at a cost of about $17,000,000. This does not include the cost of ordinary small sewers, which are installed under private contract at the expense of the owners of abutting property. Within the next fifteen years it will be necessary to expend $14,000,000 for construction of major sewers.

M. M. O'SHAUGHNESSY,
City Engineer.

Sewage Sludge as a Fertilizer

THE value of sewage sludge as a fertilizer depends entirely upon its source. The two processes of sewage treatment most commonly used at the present time are the Imhoff tank and the activated sludge process. Seasonal conditions will affect the composition of the sludge produced from either of these processes; however, the nature of the nitrogen content of the product is found to be very different when the two materials are compared.

Activated sludge, which is produced as a result of the action of aerobic bacteria on the sewage, will contain approximately 5 or 6 per cent of total nitrogen, and the total phosphoric acid content will be approximately 3 per cent. Sludge from Imhoff tanks seldom contains more than 2 or 2½ per cent nitrogen, and the total phosphoric acid content will vary from 1 to 2 per cent. The amount of potash is negligible in each case.

Estimates have been made by some engineers to indicate that one acre of land may absorb the wet sludge produced by a population of from 1,000 to 4,000. This rate will undoubtedly vary with soil conditions. One town in Texas uses six acres of land, on which the sewage sludge is distributed from a plant having a daily capacity of 350,000 gallons of sewage.

PROFESSOR HORACE J. HARPER,
Oklahoma Agricultural and Mechanical College, Stillwater, Okla.

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V. E. OHL
Director, Dept. of Streets and Public Improvements
Clairton, Pa.

WM. R. McMENIMEN
Supt. of Streets
Cambridge, Mass.

W. G. MITCHELL
Supt., Street Cleaning Dept.
Norfolk, Va.

GOLINE DOREMUS
Deputy Chief Engr., Dept. of Public Affairs
Newark, N. J.

P. J. HURTGEN
Director, Public Works
Kenosha, Wis.

Who's Who among Sanitation Officials

One of a Series of Portraits of Engineering Officials Which Has Appeared Monthly Since April, 1928

ROBERT B. BROOKS
Director, Streets and Sewers
St. Louis, Mo.

J. J. JESSUP
City Engineer
Los Angeles, Calif.

W. H. WINSHIP
Street Commissioner
Indianapolis, Ind.

M. A. MILLER
Member, Sanitary Committee
Dothan, Ala.

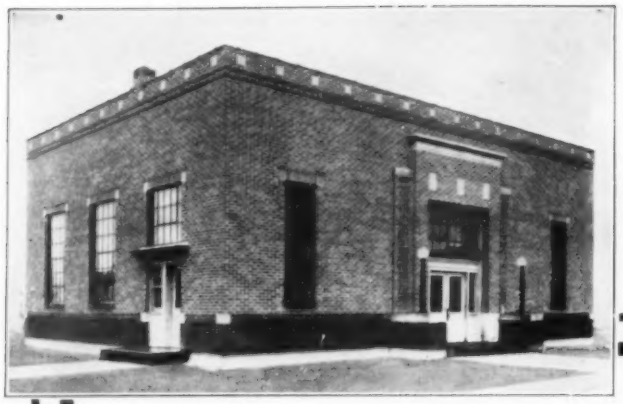
W. J. GALLIGAN
Asst. Supt., Bureau of Streets
Chicago, Ill.

E. A. MILLER
Supervisor of Maintenance, Dept. of Public Works
Rochester, N. Y.

I. R. WEEDON
Supt., Street Cleaning
Flint, Mich.

NELSON I. RAYMOND
City Engineer
Owosso, Mich.

H. W. FLEDDERMAN
Chief, Division of Street Cleaning
Louisville, Ky.



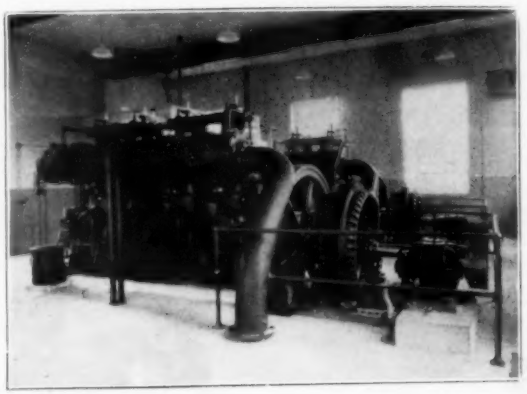
Attractive structure of Blooming Prairie Municipal Power and Light Plant.

Blooming Prairie GOES INTO THE POWER BUSINESS Installs F-M Diesel Municipal Plant

Blooming Prairie, Minnesota, is an enterprising little town of slightly over 1,000 population that usually keeps in step with modern trends. Kerosene and later gasoline street lamps were installed years ago when street lighting was rare in such small towns. Electric lighting was adopted early, but for years the citizens were dissatisfied with the electric service supplied by a power company. At inconvenient times the flow of current ceased entirely and voltage fluctuations were frequent.

Finally the citizens launched an investigation and learned that a municipal plant would be profitable and would give better service . . . that they could finance the purchase of Fairbanks-Morse Diesel power equipment from the earnings. So they stepped to the polls on November 12, 1930, and spoke in favor of establishing a municipal plant competitive to the power company, with a majority vote of almost 5 to 1. A building was constructed, a distribution system set up, and a Fairbanks-Morse Diesel plant, which included one 240 and one 120-hp. unit, was installed.

Six weeks later the municipal plant was furnishing more than 90 per cent of the total electric load and was giving unfailing service. All reports indicate that the F-M Diesel plant will be speedily paid for from the earnings. Hundreds of other municipalities have installed F-M Diesels for the sake of economy and complete satisfaction. Let our representatives show how you can finance the purchase from earnings. Or write for literature.



The two F-M Diesel generating units in the Blooming Prairie Municipal Plant. All accessory equipment was furnished by Fairbanks, Morse & Co.

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32 branches at your service throughout the United States

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Fairbanks-Morse Diesel Engines are giving dependable, low-cost service in the following municipalities:

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Tecumseh, Nebr.
Sebewaing, Mich.
Plaquemine, La.
Covington, Tenn.
Duncannon, Pa.
State Center, Iowa
Wickenburg, Ariz.
Goshen, Ind.
Blooming Prairie, Minn.

5582-OA98.69

METHODS and COSTS of REFUSE COLLECTION and DISPOSAL

Less Noise from New York's Ash Cans

FOR some time a Noise Abatement Commission has been studying the causes of excessive noises in New York City. This survey has shown that 44 per cent of the city schools are bothered by noise and the development of 470,400 children thereby injured. A previous survey has indicated that 80 per cent of New York's hospitals are surrounded with noise conditions that interfere with the recovery of patients. The Sanitary Commission of New York City in charge of ash and garbage collection recently issued orders that no collections were to be made near schools during school hours or near hospitals before 10 A.M. and after 4 P.M.

The general order by The Sanitary Commission aimed to reduce the noise caused by the collection of garbage and ashes reads as follows:

"District superintendents shall have all drivers and loaders instructed at roll call, both A.M. and P.M., that every precaution must be taken in loading vehicles to make the collection of refuse as noiseless as possible. Some noise will necessarily be made, but this must be reduced to a minimum through the careful attention of the drivers and loaders. Especially must this care be exercised in the vicinity of schools, hospitals and courthouses.

"In hospitals, the ordinary street noises retard the quick recovery of patients. Schedules for the collection of refuse in the vicinity of hospitals shall be arranged to take place between the hours of 10 A.M. and 4 P.M. so that whatever noise is made will be during the hours when it will have the least harmful effect. The use of the panscraper on the streets bounding a hospital is strictly prohibited.

"In schools, these noises interfere to a great extent with the progress made by the students, and in courthouses, with the general conduct of the court. In order that we do not contribute to these noises, schedules for the collection of refuse in the vicinity of schools and courthouses shall be arranged so that they are complete by 8:30 A.M., and the use of the panscraper by sweepers is prohibited on the streets bounding these places after that time."

Fort Collins, Colo.

The garbage of the city of Fort Collins, population 11,489, is collected and disposed of by the Fort Collins Hog Ranch Co. under a term contract without cost to the city or householders.—H. H. HARTMAN, Commissioner of Safety and Health.

Waterville, Maine

Garbage in Waterville, population 15,454, is collected both by the city and by collectors, who are not paid by the householders. The collectors use the garbage for feeding to hogs on their own farms. The city uses one Chevrolet truck and disposes of its garbage at a municipal piggery.—ARTHUR R. DAVIAU, M.D., Health Officer.

Medford, Mass.

The city of Medford, with a population of 60,117, collects its own garbage, using seven wagons and four trucks, having an average capacity of 4 cords. The garbage is bid for by farmers, who remove it from the central collection container twice daily. A 3-year contract is made with the highest bidder for the garbage.—WILLIAM A. DURANT, Highway Department.

Needham, Mass.

A private contractor is paid by the town to collect the garbage of Needham, population 11,313, using one Reo truck of 4 cubic yards capacity. Disposal is by feeding to hogs.—G. DONALD BUCKNER, Health Officer.

Newburyport, Mass.

The garbage of Newburyport, population 15,084, is collected by a contractor paid by the city. He uses four motor trucks with covered metal bodies and disposes of the garbage by delivery to a piggery.—W. N. O'BRIEN, Health Officer.

Newton, Mass.

A collector who has a contract with the city of Newton, population 68,233, gathers all of the garbage within corporate limits and disposes of it by feeding to hogs and selling it to other farmers.—GEORGE E. STUART, Street Commissioner.

Northampton, Mass.

The city of Northampton, population 24,381, makes a contract with one individual for the collection of garbage throughout the city. This contractor owns one truck and sublets sections of the city to other private collectors. The garbage is fed to hogs and any surplus is plowed under ground.—THE BOARD OF HEALTH.

Salem, Mass.

The city of Salem, population 43,353, collects all garbage with municipal equipment, which includes five wagons of 2¼ cubic yards capacity and one truck of 4 1/3 cubic yards capacity. The garbage is sold to a contractor and fed to swine.—JOHN J. MCGRATH, Agent, Board of Health.

Springfield, Mass.

The city of Springfield, population 149,900, collects the garbage with municipal equipment, which includes eight 3-yard wagons, one 1½-ton 3-yard truck and eighteen 3½-yard trailers. The garbage is disposed of by feeding to hogs.—JOSEPH F. SHEA, Deputy Superintendent, Department of Waste Disposal.

Taunton, Mass.

A contract is made jointly with two individuals by the city of Taunton, population 37,355, for the collection of garbage throughout the city. They use three 2-ton trucks and dispose of the garbage by feeding to pigs on a farm.—EVERETT HOGAN, Board of Health.

Wareham, Mass.

Arrangements for garbage collection in Wareham, population 5,686, are made by the householders with private collectors, who use five 2-ton trucks for the collection of garbage. The garbage is disposed of both by feeding to swine and by dumping.—DR. G. G. PARLOW, Board of Health.

Ann Arbor, Mich.

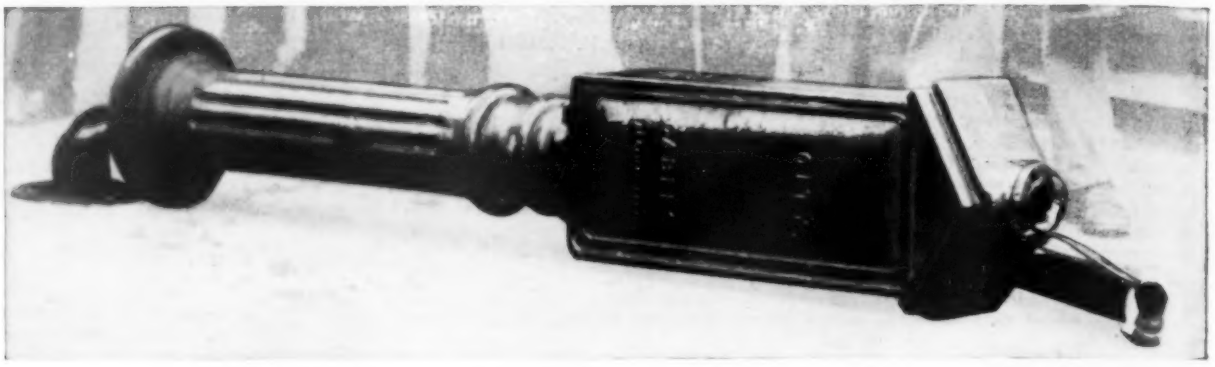
The city of Ann Arbor, population 26,944, makes a contract with one individual for the collection of garbage throughout the city. The contractor uses four 2½-ton trucks and one 5-ton truck which holds approximately 4 cubic yards of waste material. The garbage is disposed of by feeding to hogs, and part is plowed under as fertilizer.—DR. JOHN A. WESSINGER, Health Officer.

Benton Harbor, Mich.

A contractor paid by the city of Benton Harbor, population 15,434, collects all of the garbage within the city limits, using one Chevrolet and one Ford truck, during the winter, and adding one Chevrolet during the summer months, each of 1-ton capacity and with bodies 10 feet long x 3 feet deep x 4 feet wide. Garbage is delivered to a hoggery for disposal.—EDITH HATOSKY, Secretary to the City Manager.

***See the 1932 Municipal Index for* Hog Feeding with Garbage *and* Incineration and Garbage Disposal Developments in 1931**

3-FOLD *features*
SAFEGUARD FIRE ALARM SYSTEM *against this—*



Motor Vehicle Accidents No Longer Hazard the Receipt of Fire Alarms

Accidents will happen to fire alarm pedestals as a result of either careless or drunken driving of motor vehicles. One city reports an average of 70 pedestals a year disabled from this cause—another smaller city had approximately seventeen such accidents in a twelve-month period. The two photographs shown here were taken in one municipality; the pedestal in the upper view, having been knocked down *twice* in *one* month by trucks.

"A BOX A BLOCK"

In the past when a pedestal was knocked down, generally several fire alarm circuits were crippled, and scores of fire alarm boxes put out of commission for a short period, until the damage could be repaired. Now, the new 3-FOLD principle of fire alarm transmission and reception—being introduced to offset this condition and many others which were once hazardous to the receipt of fire alarms—is provided in both boxes and central office equipment of the latest Gamewell design. Complete new 3-FOLD fire alarm systems can be furnished or if your present single-fold system is of recent installation, it can be equipped with many of the 3-FOLD features.

Gamewell sales engineers are located at convenient points around the country. The one nearest to your city will be glad to explain our 3-FOLD system in more detail, and show you how it can be applied to your needs. A letter to our factory will bring him, without obligation to you or your city.

THE GAMEWELL COMPANY

NEWTON, MASSACHUSETTS

"A Box A Block"

During March we hope you will remember to mention THE AMERICAN CITY

Police—Fire—Safety Items

of Interest to Departments of Public Safety

Police Radio for New York City

A NEW radio alarm system for the Police Department of New York City was placed in operation on February 23. This service affects the Borough of Manhattan only, at present, but it is to be extended soon to the four other boroughs. Police cars to the number of 220 have been equipped with receiving sets enabling headquarters to transmit immediately to them any orders and directions for proceeding to scenes of crime and disturbance.

The system was inaugurated by Mayor James J. Walker in the office of Police Commissioner Edward P. Mulrooney. Speaking through the microphone, he gave orders to three cars in different parts of the borough to report to headquarters, which they all did within one minute and 50 seconds. Going to the broadcasting room, he then witnessed the receipt of a call for police help from an apartment house where a burglary was being attempted. A patrol car in that vicinity was notified by radio, and in five minutes reported back that the prospective burglary had been frustrated.

Commissioner Mulrooney appealed to all citizens to assist the new radio system by telephoning the police immediately of attempted crimes or dangerous conditions.

Prepare to Fight or Prevent Grass Fires

ADEQUATE control of grass and brush fires is seldom accorded much importance in connection with a city's general program of fire protection and prevention. A brief bulletin on "The Grass Fire Problem," issued by the Chamber of Commerce and Safety Council Section of the National Fire Protection Association, 60 Batterymarch Street, Boston, gives examples of five cities, large and small, where such fires constitute from 24 to 41 per cent of the total number of fires. The principal facts about grass and brush fires are stated to be that they occur (1) during certain seasons only—early spring, late fall, and during open winters; (2) only on dry days; (3) in closely grouped localities and in the same parts of the city year after year; and (4) in the daytime—most frequently from noon to 5 p.m.

Effective measures that may be taken include the burning over or clearing of vacant lots and fields of tall grass, particularly in the spring—a job where unemployed men could be utilized. Special fire apparatus, such as side cars and light trucks, can obviate the use of the regular apparatus. A fire department—or Boy Scout—patrol for the grass fire districts can prevent the spread of many fires and even the starting of some.

A Comprehensive Fire Protection System

REPORTS of the National Fire Protection Association's engineers point out commendable development of the fire defenses of Manchester, N. H. This is reflected in continued low fire losses. The fire department, under capable supervision, is well equipped and trained. Well-organized inspection work is conducted by all of the firemen continuously, and effective results have been obtained. A new building code containing excellent fire-prevention features was recently adopted. Wooden shingle roofs are now prohibited throughout the entire city. A campaign now being conducted by the fire and building departments to rid the city of conflagration breeders has resulted in the removal of many hazardous structures. Buildings with automatic sprinklers are numerous in Manchester. The basements of all public schools are sprinklered.

The fire commissioners were urged to secure the adoption of a fire prevention code to be enforced by the fire-prevention bureau of the fire department.

For More Fire Prevention

A COMMITTEE to Encourage Fire Prevention Activities has been functioning this year under the auspices of the National Association of Commercial Organization Secretaries. The chairman of the committee is C. C. Lydick, Secretary of the Moline, Ill., Chamber of Commerce, and the members for each of twelve districts, in order, are the following secretaries or other staff members of the chambers of commerce in the cities named:

Charles B. Whittelsey, Hartford, Conn.; George W. Elliott, Philadelphia, Pa.; Charles Ketchum, Greensboro, N. C.; Floyd F. Kay, Memphis, Tenn.; Wayne G. Lee, Dayton, Ohio; R. W. Tackaberry, Sioux City, Iowa; H. M. Van Auken, Wichita, Kans.; W. S. Whitten, Lincoln, Nebr.; Wm. F. Dunkerley, Pasadena, Calif.; and John Boswell, Wichita Falls, Texas.

Posters Available for Traffic Safety Campaigns

These and other posters issued by the National Safety Council, 20 North Wacker Drive, Chicago, Ill., will be found helpful in the National Traffic Safety Contest (see pages 103-105 of this issue)

10 MINUTES FOR LOADING!
5 MINUTES FOR UNLOADING!
BLOCKING FURNISHED!

A comparison of five competitive shovels finds the question of portability answered as follows:

AUSTIN BADGER . . offers a low cost pair of wheel mounts.
SHOVEL A . . offers a high priced pair of trucks.
SHOVEL B . . . . . offers an expensive trailer.
SHOVEL C . . offers no transporting equipment.
SHOVEL D . . . . . offers an expensive trailer.

The *improved* design of the Austin Badger makes it the Biggest, little shovel on the market!

GREATER PORTABILITY

Ten minutes for loading, five minutes for unloading, up to twenty-five miles per hour on the road—this greater portability of the Austin Badger is provided at lowest cost.

Other extra values of the Austin Badger are three to five times more roller bearings to provide smoother, faster operation, 1′ 2″ to 2′ 4″ more dumping height, a plus 3/8 yard (11 cu. ft.) dipper capacity, for more yards per day; roller chain crowd and the improved swing gear and turn-table. The Austin Badger is amply powered and fully convertible for crane, dragline or back filler, truly an all-purpose utility tool.

Shipped from spot stocks in twenty-seven cities and backed by seventy-two years of making and selling quality earth moving and road maintenance tools . . . Complete details, prices and specifications sent on request. Also ask for a copy of Bulletin No. 1236.

The Austin-Western Road Machinery Co., 400 North Michigan Avenue, Chicago, Ill.

S-323

The Austin-Western ROAD MACHINERY CO.

ROAD ROLLERS, CRUSHING & SCREENING PLANTS, SCARIFIERS, SWEEPERS & SPRINKLERS, ROAD GRADERS, ELEVATING GRADERS. MOTOR GRADERS, PLOWS & SCRAPERS, ROAD OILERS, ROAD DRAGS, CULVERTS, SHOVELS & CRANES, DUMP WAGONS, SNOW PLOWS.

MARCH, 1932

Vol. XLVI, No. 3

The American City

470 Fourth Avenue
New York

50 Cents, $4 a Year

Stop Hoarding Public Works!

AT the very time when the nation is aroused to the evils of hoarding by individuals, the strange idea seems to be gaining credence that the restoration of prosperity can somehow be hastened by the hoarding of public works programs.

A mistaken analogy with war-time conditions is partly responsible. We are reminded by spokesmen for "taxpayers' strikes" that fifteen years ago we abandoned many of our normal governmental expenditures—the repairing of our highways or the extension of our water works, for example—to promote the public welfare. We are vociferously urged to be both patriotic and parsimonious now. But these orators forget that the former curtailment of municipal and county expenditures was patriotic, not because it was parsimonious, but because the man-power and materials thus saved were urgently needed for the emergency of war.

Today we have no shortage of man-power or materials; our problem is to find employment for an overwhelming surplus of both. The present call to patriotism, therefore—if that term means unselfish devotion to the nation's welfare—is the call not to curtail but to carry on, to the greatest extent possible, the voting and wise spending of public funds for planned and needed public improvements. Not only will such statesmanship put our idle hands and factories to work; its heritage, when these troublous times are over, will be permanent assets in community values and human self-respect, instead of the demoralizing dissipation of the dole to which we must otherwise resort.

It cannot be doubted that, if public bodies generally had shown, during 1930 and 1931, the signs of unreasoning panic that many of them are now displaying, their 1932 difficulties with the embattled taxpayers would not be less, but much greater, than at present.

Nor can it be doubted that today's tax delinquencies in many cities are much greater than necessity requires. In such cases the appeal should be, not for a curtailment of needed public expenditures, but for a prompt and patriotic payment by property owners of their legal and moral obligations to the municipality without whose services the taxpayers' land would lose practically all of its remaining market value.

The way to restore prosperity is neither by the hoarding of private capital nor by the hoarding of public works. These are days when individual "thrift" in many instances is an unsocial act; and when public "thrift," other than the elimination of waste and graft, is an enemy rather than a friend in our war against human misery.

The present economic emergency is as great as the military emergency of the World War. Shall we meet the 1932 call to service by a cowardly retreat into our safe-deposit vaults, or by the boldness of private initiative and public spending without which the victory of 1918 would never have been won?

Are Your Banks Helping or Hindering?

NOT a little of the unwise curtailment of needed public works and services, referred to above, is traceable, not to pressure from taxpayers, but to the present unwillingness or inability of the banks and investment houses to handle sound municipal securities for which there would normally be a ready market. In some cities financial institutions, now feeling that they have the upper hand, are insisting on "economies" which, by adding to unemployment and to the deterioration of property values, may cost much more than the taxes they save.

There seems little hope for aid from the Federal Government in thawing out frozen municipal credits. The amendments just adopted to the Federal Reserve Act have not liberalized the provisions of Section 14, under which in extending aid to municipalities the Federal Reserve banks have had the power merely to buy and sell "bills, notes, revenue bonds, and warrants with a maturity from date of purchase of not exceeding six months, issued in anticipation of the collection of taxes or in anticipation of the receipt of assured revenues by any state, county, district, political subdivision, or municipality in the continental United States, including irrigation, drainage and reclamation districts, such purchases to be made in accordance with rules and regulations prescribed by the Federal Reserve Board." Even these limited provisions have never been made effective in some of the Federal Reserve districts.

It is hoped that the recent creation of the Reconstruction Finance Corporation and the newly enlarged powers of the Federal Reserve Board, although not directly affecting municipal securities, may have some psychological effect in removing the fears of the banks and the investing public, with the result that the banks may be more willing to use the powers and resources they now have. Otherwise, municipalities may be forced to resort to selling their bonds "over the counter," as they have been authorized to do in an act of the 1932 New Jersey Legislature; or some form of state public credit association, such as has been proposed in New York, Massachusetts, New Jersey and elsewhere, may prove to be the way out.

Untreated Ground Water Supplies Are Potential Hazards

By C. H. EASTWOOD

THE danger of taking the purity and safety of underground water supplies for granted is becoming increasingly apparent to the public health and water-works professions. While the necessity for adequate treatment of surface supplies is readily admitted and complete treatments are provided to insure the bacteriological quality of such waters, most people are inclined to accept without question the purity and sterility of water obtained from an underground source.

The fact that this belief is entirely erroneous is plainly shown by a review of the statistics dealing with contamination of subsurface supplies. A complete analysis by the Kansas State Board of Health brought out the following startling revelations: 25 per cent of the ground water supplies had perfect records for one year, that is, records of analysis for a year without B. Coli or B. Aerogenes in any sample; 12.1 per cent had perfect records for two years; 6.2 per cent for three years; 4.3 per cent for four years; 3.1 per cent for five years; 2.7 per cent for six years; 1.2 per cent for seven years; and *less than one per cent* of the supplies had perfect records for eight or nine years. Though these statistics deal only with the ground supplies of the state of Kansas, they are nevertheless of startling import, since they show that every supply may be at some time subject to bacterial contamination.

Defects of Underground Supplies

To consider first the general defects which are common to all types of ground water supplies, perhaps the most usual fault is poor location of the supply source. Care should be taken in locating the supply to prevent surface drainage and flooding in times of high water, and to avoid proximity to sources of surface or subsurface pollution such as sewers, privies, septic tanks, cesspools, abandoned wells, polluted streams or any other means by which pollution might enter the ground in the neighborhood of the supply. The epidemic at Gouverneur, N. Y., where a polluted stream overflowed ground alongside a well, was an excellent example of pollution of a poorly located supply.

Abandoned wells, unless properly capped and sealed, often carry pollution directly into the water-bearing stratum. Drainage wells are equally to be condemned in most cases. A notable example was at Fond du Lac, Wis., where an abandoned well served to pollute the city supply, resulting in the disastrous epidemic of 1929.

A new channel was opened for the Fond du Lac River and it passed unnoticed over an abandoned well. Positive evidence that the supply was contaminated by polluted river water flowing down this well and through an underground channel to the city wells was obtained by dissolving salt in a cofferdam around the abandoned well and taking chloride tests on the city wells. The connection was so direct that in 18 hours the concentration in one well built up to 263 p.p.m. The epidemic caused by this pollution resulted in 1,050 cases of typhoid and dysentery.

Another epidemic from a similar cause was at Bad Axe, Mich., in 1921. When the wells were drilled, a charge of dynamite was exploded in each well. As the Marshall sandstone underlying this section is of a very dense nature, pollution must have traveled through the fissures produced in the sandstone by the dynamiting. One of the wells was abandoned and poorly sealed. Polluted ground water flowed down the well and polluted the drinking supply; 75 per cent of the entire population were stricken with serious intestinal disorders in less than a week.

Poorly constructed suction or gravity piping located so that a leak in the line might allow pollution to enter, can be equally dangerous. An outstanding example of this fault was found at Fairmount, N. Dak., where water and sewer lines were laid in the same trench along the railroad tracks. It was thought that vibrations caused by passing trains produced leaks in the mains, since it was definitely shown that grossly polluted sewage from the sewer lines entered the water main.

Another example of pollution of a gravity collecting line was at Salem, Ohio, and resulted in the epidemic of 1920-21. The water supply of Salem was drawn from three groups of deep wells. Water flows from these wells by gravity into three reservoirs and is pumped from these into the city mains. From one group of wells the water is conveyed through a vitrified clay pipe. About five years before the epidemic this line had been cleaned because of tree roots growing into it and obstructing the flow, and evidently, when these roots were cut away, holes were left which allowed polluted ground water seepage to enter and pollute the supply. The statistics of the epidemic showed 7,000 cases of dysentery, 884 cases of typhoid and 27 deaths.

Helena, Mont., was yet another case of collecting-line pollution. The water supply for Helena was obtained from an underground stream in an abandoned mine. A gravity tile water line carried the water down a gulch, the grade of the line being less than that of the surface of the ground. A sanitary sewer line above this sheared off at a manhole, and sewage seeped through the ground and into the joints of the tile line and polluted the supply. The epidemic which occurred in 1929 resulted in 205 cases of typhoid and 17 deaths.

The reservoir, either collecting or storage, or the suction or receiving well, can be the gateway for pollution if poorly located or improperly constructed. An example of what may happen because of poor location occurred at Marseilles, Ind., when the collecting reservoir which adjoined the polluted Illinois River developed a leak at the bottom through which the polluted river water flowed in a half-inch stream. The reservoir had been struck by lightning sometime previously and it was thought by the investigating engineers that this had caused the leak.

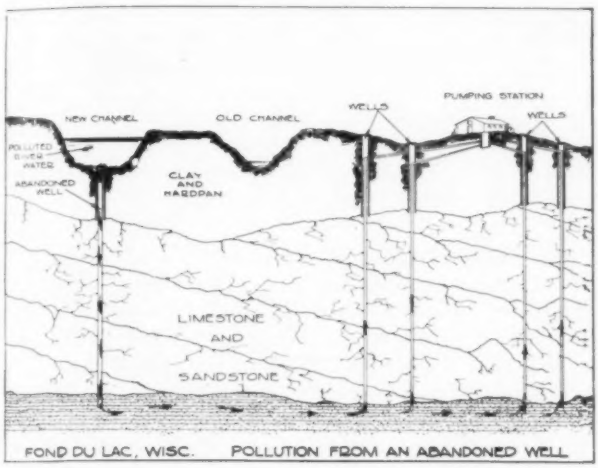
Cross-connection with a polluted supply may be and often is the means by which a safe source of supply is contaminated. Old forgotten piping or a hook-up with an emergency fire supply from a polluted source has resulted

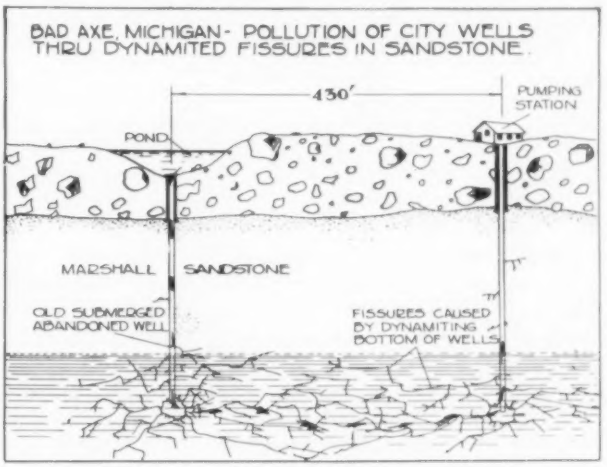
in some of the worst epidemics yet recorded. No matter how well protected, a cross-connection is always a definite hazard and should be avoided if in any way possible. A few examples of epidemics from cross-connections are found in Bloomington, Ill.; Fort Wayne, Ind.; Schenectady, N. Y.; Cochrane, Ontario and Neenah, Wis.

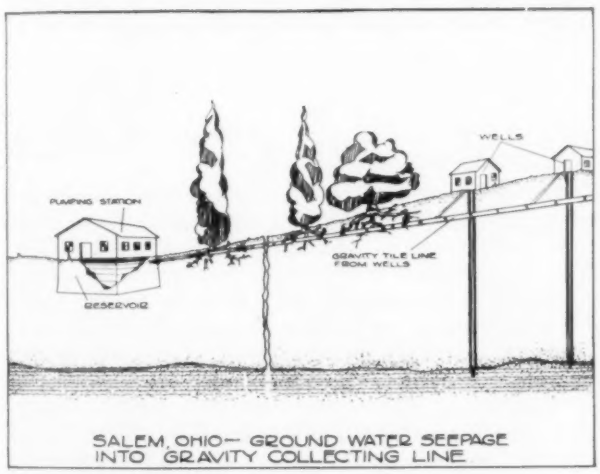
Specific Defects in Well Supplies

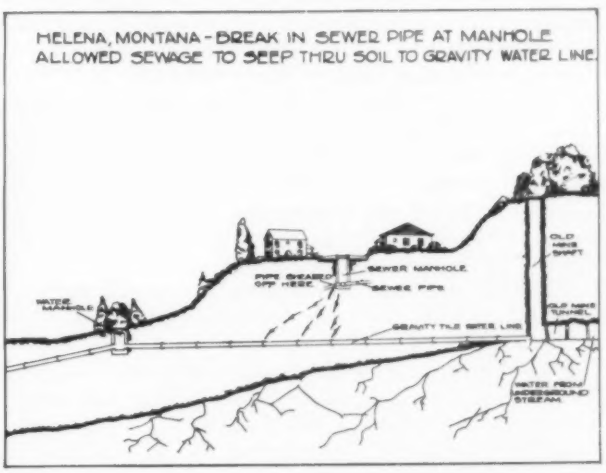
Well supplies are subject to pollution either at the surface or by underground contamination. Shallow or dug wells are naturally most liable to surface contamination, though improper construction may allow such contamination of any type of well. The path of pollution may be due to direct percolation through the ground, carrying contamination into the water-bearing stratum, or through holes, allowing seepage directly into the well.

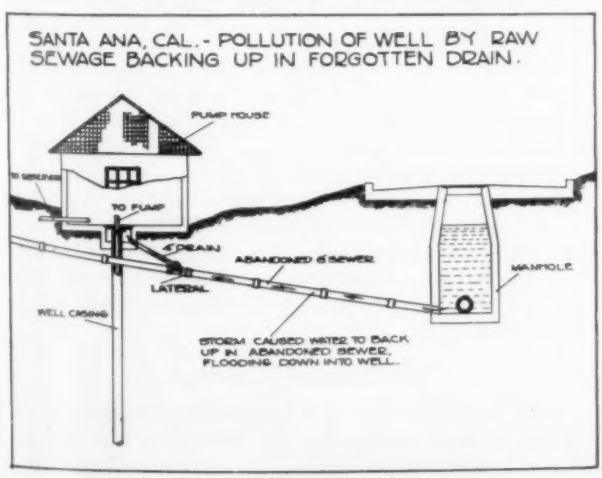
Surface contamination may be introduced into a well by connection of the well pit or subground level pump

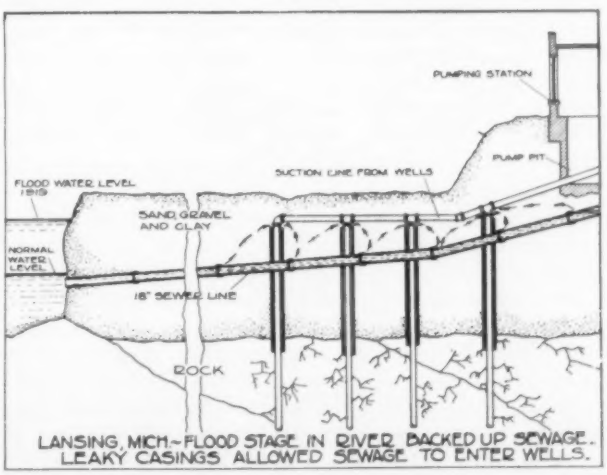



BAD AXE, MICHIGAN- POLLUTION OF CITY WELLS THRU DYNAMITED FISSURES IN SANDSTONE.
430'
PUMPING STATION
POND
MARSHALL SANDSTONE
OLD SUBMERGED ABANDONED WELL
FISSURES CAUSED BY DYNAMITING BOTTOM OF WELLS

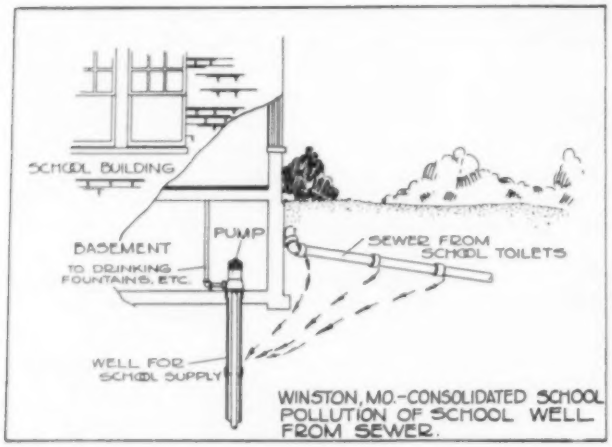


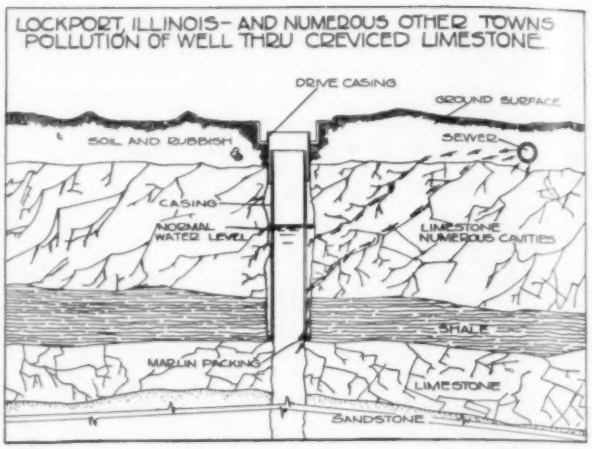

HELENA, MONTANA - BREAK IN SEWER PIPE AT MANHOLE ALLOWED SEWAGE TO SEEP THRU SOIL TO GRAVITY WATER LINE.
OLD MINE SHAFT
SEWER MANHOLE
SEWER PIPE
GRAVITY TILE WATER LINE


SANTA ANA, CAL. - POLLUTION OF WELL BY RAW SEWAGE BACKING UP IN FORGOTTEN DRAIN.
PUMP HOUSE
TO PUMP
4" DRAIN
ABANDONED 6" SEWER
LATERAL
MANHOLE
WELL CASING
STORM CAUSED WATER TO BACK UP IN ABANDONED SEWER, FLOODING DOWN INTO WELL.


PUMPING STATION
PUMP PIT
SUCTION LINE FROM WELLS
FLOOD WATER LEVEL 1919
SAND, GRAVEL AND CLAY
NORMAL WATER LEVEL
18" SEWER LINE
ROCK
LANSING, MICH.- FLOOD STAGE IN RIVER BACKED UP SEWAGE. LEAKY CASINGS ALLOWED SEWAGE TO ENTER WELLS.

EXAMPLES OF POLLUTION MENTIONED IN THE TEXT





ADDITIONAL FREQUENT CAUSES OF POLLUTION OF UNDERGROUND WATER SOURCES

room to a sewer or drain subject to back flow. The outstanding example of this defect was at Santa Ana, Calif. The source of pollution, wholly unknown when the epidemic broke out, was found to be a drain in the pit around the top of the casing of one of the city wells. This 4-inch drain led into an old 8-inch sewer lateral which led directly into the trunk sewer. A heavy rainstorm backed sewage up this lateral and through the drain into the top of the well. It was calculated that the drinking water delivered to the people was 9 parts water and one part sewage. The epidemic resulted in 10,000 cases of dysentery, 369 cases of typhoid and 28 deaths.

Adequate facilities for removing waste water or seepage from a well pit or pump room are construction details which are often overlooked. Unless a drain to an open outlet, or a sump and automatic ejector or other suitable means of removing the accumulated water, is provided, it is practically certain that some of it will find its way into the well, with consequent pollution.

The lack of a watertight connection on cased wells to close the annular opening between the well casing and the pump column is another common construction defect. The outside casing of wells should be extended above the level of the ground or floor of the pump room and the annular opening made absolutely watertight.

Leaky well casings were blamed for the epidemic at Lansing, Mich., in 1919. Heavy rains on March 16 caused the Grand River to rise 12 feet, placing a 2½-foot static head on an 18-inch sewer. Concentrated sewage was forced out into the sandy soil around the wells. Leaky well casings completed the setting. About 3,000 cases of dysentery, 82 cases of typhoid and 11 deaths resulted. This is an example of poor location as well as poor construction of casings.

The lack of a watertight top for dug and bored wells is equally dangerous, since unless the cover is made tight and manholes and pump pipe are properly protected, contaminated waste water will have ready access to the well.

On shallow wells too little attention is paid to securing a watertight curb or casing extending deep enough to exclude polluted surface water. Brick, vitrified clay and concrete casings are often put in carelessly, with open joints allowing seepage directly into the well.

A startling epidemic, the chief blame for which was laid to the tile-lined well, occurred at the Winston, Mo., Consolidated School. A leaky sewer line carrying sewage from school toilets loosed gross pollution into the ground to find its way into the basement well. The course of pollution was definitely proved by placing fluorescein dye in the toilets; in seventy-two hours it appeared in the well water. The stricken included 35.9 per cent of the pupils and teachers, or 83 cases and 3 deaths.

On wells pumped by air lift, failure to properly locate and protect the air inlet is a common fault. Unless the air inlet is constructed so that dust and other contaminating materials are excluded, pollution of the supply is nearly certain to result.

The sanitary defects which may permit underground contamination of wells are equally important and even more dangerous, since they are hidden and regular inspections are impossible.

In the construction of deep wells failure to extend a watertight outside casing to a sufficient depth and seal into a solid stratum is the fault most often found. This defect is particularly dangerous in sections of the country underlaid with limestone, lava flows or similar formations, abounding in solution channels, faults and sinkholes. Examples have been found where pollution has traveled for miles through fissured rock formations to a drinking supply. Either screw joint steel or wrought iron pipe is the standard well casing for drilled wells and can be installed watertight if care is used in putting it in and a satisfactory seal is provided at the bottom.

The combination of fissured rock formation and faulty casing construction has been the cause of numerous epidemics throughout the country. Lockport, Riverside, and Watseka, Ill.; Rogers City, Mich.; Sturgeon Bay, Wis., and numerous others all came to grief from this cause.

Holes in the casing produced by corrosion are at all times dangerous and to be closely watched for. Some well waters are highly corrosive, and the development of these faults above a safe water-bearing stratum cannot but lead to contamination from seepage directly into the well. White Water, Wis., is an example of an epidemic blamed to this defect.

Trouble with Springs

While springs make up a far smaller percentage of the country's water supply than do wells, they are nevertheless of importance and their most common sanitary defects should be considered. The ordinary layman is inclined to believe that spring water and pure water are synono-

mous terms, but that this belief is completely at variance with the facts has been proved time and again by instances of contaminated springs in all sections of the country.

The most common fault in spring supplies is the lack of adequate surface protection. Failure to provide for a proper curb and cover to keep out surface water washing or flooding from high water in an adjacent watercourse can eventually lead to only one result. A tight concrete curbing and top for a spring-water reservoir with an overflow above back-water level is necessary if contamination is to be avoided. Examples of springs flooded by rise in the river level are to be found in the epidemics at New Providence and London, Tenn.

Underground contamination of springs is likely to occur through surface water or pollution reaching the water-bearing stratum from which the spring takes its origin. This is particularly true in a country underlaid with a limestone formation with its natural sink-holes and solution cavities. In many instances sink-holes and streams have been found directly connected with springs through crevices and fissures. The epidemics caused by the supplies at Greenville, Tenn., and Clinchburg, Va., are examples of underground contamination of springs.

Mine Drainage and Infiltration Galleries Are Questionable Sources

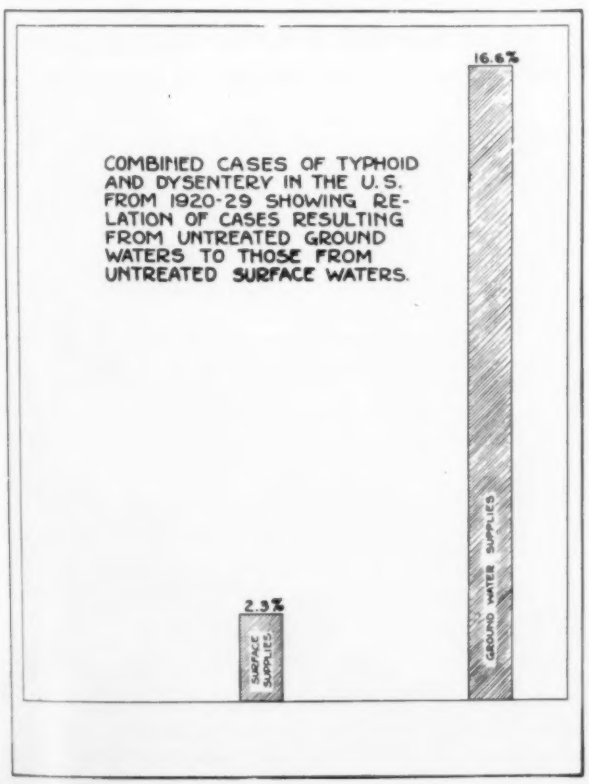
The use of mine drainage for water supply without treatment is a dangerous practice. If the mine is being worked, the treatment is particularly essential, since few mines are equipped with sanitary toilet facilities, and gross pollution can be the only result. Even if a special water-supply drift is used, there is always the danger of flooding by general mine drainage unless the bulkhead used to block it off is absolutely watertight.

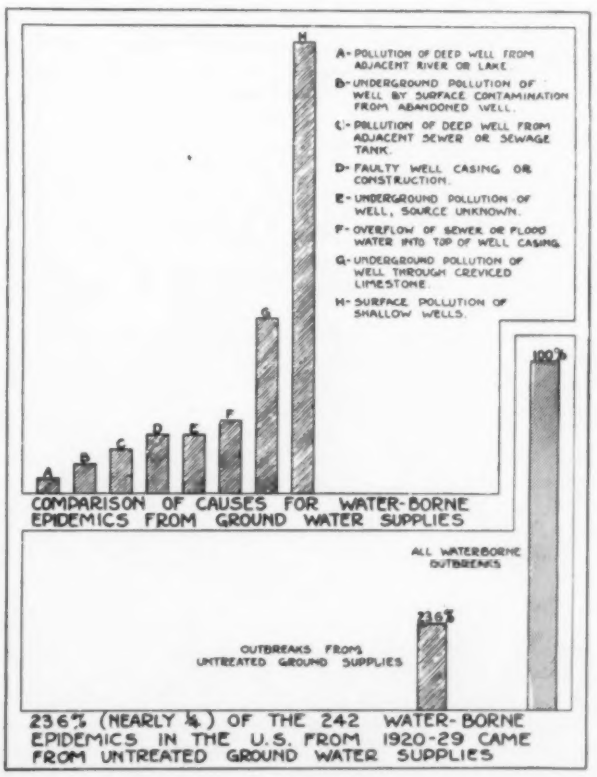
As in the case of mine drainage, the use of untreated water from infiltration galleries is nearly certain to result sooner or later in a polluted supply, with the usual disastrous epidemic. No matter how complete the removal of turbidity through the filtering stratum, the bacterial removal is always unreliable, and purity can be insured only by adequate treatment. Examples of epidemics in supplies from infiltration galleries may be found in the cases of Yorkville, Ill., Delaware, Ohio, and Wellsville, Ohio.

False Security

The false feeling of security which is the usual attitude toward ground water supplies often prevents the discovery of a defect which is not peculiar to ground water supplies alone. The collecting main, reservoir or distribution system may furnish the entrance for pollution, but since the source of supply is accepted as pure, the susceptibility of the rest of the system is often ignored.

The results of this laxity in regard to protection of well supplies are graphically illustrated by the published statistics on typhoid epidemics in the 1920-29 decade. The thousands of cases of typhoid and dysentery from epidemics occurring through untreated ground water supplies speak their own indictment. The published statistics of this decade show that 16.6 per cent of all cases of typhoid and dysentery came from untreated ground water supplies, while 2.3 per cent came from untreated surface water—eight times as many from ground as from surface supplies. These figures alone are enough to show that the attention of the water-works profession must be centered on the treatment and protection of ground water supplies.


COMBINED CASES OF TYPHOID AND DYSENTERY IN THE U.S. FROM 1920-29 SHOWING RELATION OF CASES RESULTING FROM UNTREATED GROUND WATERS TO THOSE FROM UNTREATED SURFACE WATERS.
16.6%
2.3%
SURFACE SUPPLIES
GROUND WATER SUPPLIES


A- POLLUTION OF DEEP WELL FROM ADJACENT RIVER OR LAKE.
B- UNDERGROUND POLLUTION OF WELL BY SURFACE CONTAMINATION FROM ABANDONED WELL.
C- POLLUTION OF DEEP WELL FROM ADJACENT SEWER OR SEWAGE TANK.
D- FAULTY WELL CASING OR CONSTRUCTION.
E- UNDERGROUND POLLUTION OF WELL, SOURCE UNKNOWN.
F- OVERFLOW OF SEWER OR FLOOD WATER INTO TOP OF WELL CASING.
G- UNDERGROUND POLLUTION OF WELL THROUGH CREVICED LIMESTONE.
H- SURFACE POLLUTION OF SHALLOW WELLS.
COMPARISON OF CAUSES FOR WATER-BORNE EPIDEMICS FROM GROUND WATER SUPPLIES
ALL WATERBORNE OUTBREAKS
100%
OUTBREAKS FROM UNTREATED GROUND SUPPLIES
23.6%
23.6% (NEARLY ¼) OF THE 242 WATER-BORNE EPIDEMICS IN THE U.S. FROM 1920-29 CAME FROM UNTREATED GROUND WATER SUPPLIES

Of all the water-borne outbreaks in the 1920-29 period, 23.6 per cent, or nearly one-quarter of the total, were on untreated ground water supplies.

At the recent meeting of the Conference of State Sanitary Engineers, the Committee on Water Purification and Treatment presented in condensed form a census of the country's water plants. Containing much interesting information for the water-works profession, this report discloses the fact that "roughly four out of five urban dwellers in this country are now supplied with water artificially purified in some degree." A further study of the figures shows that of plants employing purification methods other than simple chlorination, 86 per cent were surface supplies while only 14 per cent were ground supplies. At those plants where chlorination alone is practiced, 53 per cent of the total number were surface supplies and 47 per cent were ground supplies. These statistics are both logical and encouraging, since they show that while elaborate purification methods are indicated mostly on surface supplies, ground water supplies are nearly equal in the number of plants employing protective sterilization.

No discussion of the hazards of ground water supplies and the means to correct them could be complete without emphasizing the need for frequent and regular bacteriological examinations. If the supply is untreated, not one examination when the supply is opened, or irregular or infrequent sampling, can suffice, but complete and repeated bacteriological examinations must be made at short enough intervals so that any evidence of pollution can be immediately detected. The failure to keep a constant watch over an untreated supply can be classed only as definite negligence.

Where chlorination is practiced, routine ortho-tolidin tests should necessarily be performed at frequent intervals and a record of the chlorine residual maintained. Such records are at all times desirable evidence of effective chlorination, and unexpected increases in chlorine demand may often serve as an indication of contamination, leading to discovery of pollution sources hitherto unsuspected.

Not All Ground Waters Are Polluted, But—

To imply that all ground waters are continuously contaminated is ridiculous—but sufficient evidence has been presented to prove that even the most unsuspected supply may some day—without warning—become contaminated. It is in this fact that the danger lies. Continued freedom from apparent pollution hazards, coupled with the age-old fallacy regarding the universal purity of ground waters, builds up a false sense of security that has, only too often, been disturbed by a disastrous disease epidemic.

Supervision—precaution—protection—are, in the enlightened opinion of today, just as essential for ground water supplies as they are for the more generally contaminated, but no more potentially dangerous, surface supplies. Today the public health authority, the sanitarian and the responsible water-works official are rapidly subscribing to the conviction that all ground waters are potential health hazards—and, as such, should be hedged with all available safeguards.

ACKNOWLEDGMENT.—From a paper presented at a North Carolina Section meeting of the American Water Works Association.

A Plea for City Planning with Brains and Teeth

By **WALTER B. WEISENBURGER**
President, St. Louis Chamber of Commerce

WE need an official city planning ordinance with teeth in it. Back in the good old days, St. Louis used to rave about a million population. I take off my hat to the gentry of that day. It was a splendid vehicle of enthusiasm. But there is a waning of interest in mere bigness and we are looking for better cities nowadays; for a city in which people who want to become customers can travel to and fro expeditiously. . . . We are looking for a city whose centralized business values are not concentrated in a vacuum of dry rot. An unplanned past and an uncharted future cause vast blighted districts, whose uses are few and their values correspondingly low.

Much that St. Louis has in the way of pleasing modernness it owes to the fact that it was a pioneer in the idea of city planning. Olive Street, Gravois Road, Kingshighway Northwest, are visible evidences that city planning pays.

We of all cities have seen its effectiveness. In getting those effects we have learned that for a city plan to serve its highest purpose it must not be just a pretty picture, but a diagram to be rigidly followed. Strict adherence to a definite, official plan and its principles over a long period of time will build a pleasing, satisfying city of balanced functions and protected values.

Our City Plan in St. Louis is neither complete nor official. It is just the third or fourth corner of a scrap over every development. My brief is not for persons, but for the principle of official planning as sound procedure. Mr. Business Man, do you think of trees, of grass plots, calla lilies, and sparkling fountains when city planning is mentioned? If you do, you are far off the trail. It is no folderol, plaything, or appendage. It is a major process, recognized as such by banks, insurance companies, and investment concerns, who have found that it offers a dependable background for the investment of moneys in community values. It is an even greater protection to the small owner who has his all invested in a home.

A Plan That Will Stay Put

To have a city plan that can be tampered with overnight, without due notice, in so-called spot-zoning, is to slowly undermine the security back of all property investments. The picture when once adopted should become an accepted pattern for a Greater St. Louis—one that cannot be changed at whim to meet small requirements, but whose bigness of purpose must be preserved at all hazards. To do this, these things are needed:

1. A comprehensive, official city plan, providing for a definite absorption of various phases of city life—industrial, residential, commercial, based upon absorption capacity for each use and not on speculation, presupposing unlimited growth.
2. A sound ordinance or charter amendment authorizing the plan.
3. Competent administration of the plan that will not brook infringements.
4. A public understanding and deep interest in the plan.
5. Coordination of all factors involved in city planning and improvement work.

To pursue this ideal of city planning half-heartedly in any other fashion is to produce speculation and grief, and cause economic waste, which eventually finds its reflection in our tax rate.

Denver Provides More Space for Traffic

TREES WERE HANDLED WITH GREAT CARE
1. The old and the new tree lines on East Colfax Street. 2. Banding a tree and making ready to move it back

Extensive Improvement Has Been Carried Out Through Street Widening, Curb Removal and Construction, and the Moving of Trees

By **JOSEPH C. COYLE**

DURING 1931 an extensive street-widening program has been carried out in Denver, Colo., to relieve the growing demands of motor traffic. Several blocks on east Colfax and south Broadway, from Colfax to Bayaud, as well as a long stretch of Larimer and other streets in the business district, have been widened. On east Colfax, adjacent to the State Capitol grounds, the work involved the moving of a number of large shade trees to new positions in the parking, and the removal of others. On south Broadway a portion of the old sidewalk and the curb were removed, poles of the tramway company were moved back, and the street drainage was changed.

Pouring a New Type of Curb

On all the new street work a different type of curb, on corners as well as along the street, has been installed. The new curbing is high, with a considerable slope. This will greatly aid the motorist in parking and in getting away from the curb, as compared to the old type of vertical curb, which hugged the wheels of a car. The curb is 4¾ inches thick at the top and 9 inches thick at the bottom. It was poured between specially constructed wooden forms, held in place by steel pins at the bottom and by specially forged U clamps over the top edge. In pouring, a Dandie Koehring mixer was pulled along by a 2-ton Caterpillar tractor, the mix reaching the forms through an adjustable chute.

Repairing the Streets

Loudermilk Brothers, subcontractors, removed and loaded the old curb and sidewalk stones with a derrick on the rear of a truck. Old catch-basins at the street corners were removed and new ones constructed, several feet from the corners by the Western Paving & Construction Co., the general contractors. The new concrete slab on each side of Broadway is 6 feet wide and 6 inches thick. As the new work projects some 4 inches above the asphalt on the old portion of the street, a new wedge-shaped strip of asphalt will be applied to even up the surface at the

REMOVING THE OLD CURB AND POURING THE NEW CURB
1. This truck-mounted crane pulled out the old curb and sections of sidewalks. 2. The mixer poured direct to the forms and was moved along by a crawler tractor

junction of the old and new work. The new concrete will not be asphalted. It will give plenty of additional room on each side of the street for parking, in addition to the old street area. A gradual slope will replace the old vertical curb at all street corners, lessening the danger of falls for pedestrians.

A section of side street was blocked off for the 1-yard Koehring paver, which delivered the batches into dump-trucks for hauling to the job. A lane, blocked off along the edge of the old pavement, allowed these trucks to operate independently of traffic.

Trees Protected or Moved

On east Colfax, where three blocks were widened by the same company, the trees were moved back by the City Highway Department during the winter, when the earth was frozen to a depth of several inches, which prevented the loss of dirt about the roots.

The tops of the trees were cut back and a trench excavated about them, some 5 feet from the body, using a portable Gardner-Denver compressor and two paving breakers of the same make. Burlap was placed about the earth adhering to the tree roots and was bound in place with a band composed of 6 x 30-inch strips of metal, with 1½-inch chains threaded through loops at each end. A block and tackle was attached to another tree, with chains about a shield of wood, and a truck was then used to drag the tree a distance of 8 to 10 feet, to their new location. The transplanting gives every evidence of having been successful.

A. K. Vickery is City Engineer, and G. E. Rolston was construction superintendent for the contractors. The Colfax and Broadway jobs were completed in less than six weeks.

The City Manager's Report to the City Council

Hinton's Brief Mimeographed Report at Beginning of Year Has Punch

RECENTLY, the report of the City Manager, of Hinton, W. Va., dated January 9, was received by THE AMERICAN CITY. This has made a real impression because of its forceful presentation of two sets of facts on four mimeographed pages, with a graph and other drawings.

The first section, under the heading, "Surprising Results," shows the increased collection of taxes during the annual discount period, for the last five years, as compared with the preceding four years. A uniform annual increase of 2 per cent in the amount of tax collection, occurred in 1928, 1929, and 1930, as the result of a special effort to secure discounted payments. Anticipating a decrease, the city administration set out in August, 1931, to devise plans intended to offset what appeared to be an extremely lean tax year, when, even with forced optimism, it was felt that an unusually fine response would have to be secured to keep collections from falling below the 46 per cent record set the previous November. To this end, tax statements were in the mail early in October; the bill of all taxpayers accustomed to remitting during November, were pre-discounted; and large signs were displayed in the windows of the tax office, reminding each passing citizen to pay his taxes during the discount period. As the result, a 5 per cent increase was attained.

The obvious story behind this is that there are a certain number of citizens who religiously pay their taxes and take the discount. They do this as a matter of business principle and regardless of whether they receive statements or are otherwise notified concerning their taxes. This group in Hinton, normally represents one out of every four taxpayers, and they pay over 40 per cent of the total tax levy—51 per cent in 1931.

From the chart presented in the report, it is apparent that the same small group followed this practice before Hinton and Avis were consolidated into a corporate unit and before any attempt was made to enlarge the income. Discounting was doubtlessly created merely for the purpose of making tax collection easier in the days when no one was charged with this particular responsibility and when commissions were paid upon the amounts collected.

The next lesson from the chart is, that more taxes are being discounted each year, the increase beginning with the inception of the council-manager plan in 1927, and now representing an 11 per cent gain over former methods.

A "BEFORE AND AFTER" SKETCH REPRODUCED FROM THE CITY MANAGER'S MIMEOGRAPHED REPORT

Mailing pre-discounted statements, together with checks which need only to be signed (the amounts having already been filled in), and information bulletins which explain local government to the taxpayers, has been instrumental in bringing about this increase. But the administration of Hinton has expressed the hope that this is also partly due to the possibility that citizens are gradually becoming more willing to pay their taxes and take advantage of the discount, instead of dodging payment until the last moment, as though municipal taxes were extremely unpleasant to settle.

The Trash-Can Problem

More than half of the premises in Hinton are without proper and adequate garbage, trash and ash receptacles, according to the City Manager's report. The illustrations reproduced with this article appear in the mimeographed report, and the following text is quoted from the report:

"Each tenant, or resident, should have a standard, steel ash can, equipped with handle and cover. This can should have a capacity of about 30 gallons. Some residents provide such a receptacle, but most houses use all manner of substitutes. Wood barrels, boxes, and even paper containers are used for ashes. Such devices are potential fire hazards and a nuisance in ash collection. Due to small size and difficulty in handling, two or three trips are often necessary to remove ashes from a single household.

"A similar container should be provided for trash and rubbish, but the largest difficulty encountered is in the removal of garbage. This is due to the fact that wholly inadequate and improper receptacles are provided by most homes. A metal garbage pail of approximately 5-gallon capacity, equipped with a carrying bail and close-fitting cover, is essential to the good health of the householder, and efficient collection and removal by the garbage trucks. Instead, many houses have small cans, lard pails, buckets, dishpans, and sometimes just plain paper bags in which garbage is placed. It is no wonder that people with such equipment need their garbage removed every two or three days!

"Such a condition, it is admitted, has developed largely as a consequence of the city maintaining a much too efficient and accommodating collection and removal service for the past few years. We have, by too frequent and uncomplaining service, allowed many to expect an almost personal, instead of public, attention, to this phase of modern housekeeping. The remedy lies in enacting an ordinance which prescribes that all premises be equipped with adequate and proper receptacles for ashes, trash, and garbage."

Such an ordinance was prepared, and was submitted for consideration, at the meeting of the Council early in January, at which it was passed. This ordinance enables the Sanitary Department to reduce operating costs by obviating the necessity of many unnecessary trips from house to truck, thus speeding up waste removal. With this brought about, there is no doubt that the former frequency schedule, which was cut to reduce the city budget, can soon be restored and maintained with the same reduced personnel and equipment. A copy of the ordinance follows:

AN ORDINANCE AMENDING ORDINANCE NO. 34 OF THE CITY CODE IN RESPECT TO SPECIFICATIONS FOR STANDARD CONTAINERS AND PRESCRIBING THE MANNER IN WHICH ASHES, TRASH, AND GARBAGE MAY BE STORED

1. It shall be unlawful for any individual, firm, or corporation to permit ashes, trash, or garbage to accumulate on or about their premises or the premises occupied by them, unless such refuse is kept separately in standard ash, trash, and garbage containers as provided herein;

2. It shall be unlawful for any municipal employee to collect or remove at the expense of the city any trash, ashes, or garbage from the premises of any individual, firm, or corporation, or tenant thereof, unless such premises are provided with standard ash, trash, and garbage containers, specified herein, and unless such ashes, trash, and garbage is kept stored in such standard containers;

3. The "standard ash, trash, and garbage containers," referred to in this ordinance, shall meet the following specifications:

a. *Ash Container.*—Standard containers for the storage of ashes shall be substantially made of metal, shall have a capacity of not less than 30 nor more than 50 gallons, and shall be equipped with at least two carrying handles and a tight-fitting metal cover.

b. *Trash Container.*—Same as (a) above.

c. *Garbage Container.*—Standard containers for the storage of garbage shall be substantially made of metal, leak-proof and watertight, shall have a capacity of approximately 5 gallons, and shall be equipped with an adequate carrying bail and a tight-fitting metal cover.

4. Violation of this ordinance, or of any of the provisions thereof, shall revoke the right of the offending citizens to have their ashes, trash, or garbage removed by the city sanitation department so long as the violation exists.

5. This ordinance shall become effective and shall be in full force on and after March 1, 1932.

State Control—or Cooperation—in Local Finance

METHODS of control or review of local tax and improvement budgets by state or county agencies are constructively criticized by Dr. Wylie Kilpatrick in two articles on "Tax and Expenditure Control," in the December and January issues of *New Jersey Municipalities*.[1] The much-discussed Indiana plan[2] empowering the state tax board, on the appeal of ten taxpayers, to review budgets or bond issues and approve, reject or reduce, but not increase, them, is analyzed. While in recent years Indiana has occupied a midway position among the states, with local tax increases neither unusually high nor markedly retarded, the plan discourages citizen participation in budget-making, offers an incentive to padding and lessens the responsibility of local officials; and the state board is unable to give careful consideration even to the small percentage of budgets appealed. Tax reductions ordered have sometimes been produced by dubious expedients requiring larger borrowing.

The scheme of complete state centralization in New Mexico is examined, and it is pointed out that careful study of budgetary costs has been lacking except where, in the case of schools, county budget commissions have been established, forming a local basis of review. The case of Multnomah County, Oregon, containing the city of Portland and seventeen other taxing districts, over which a state-appointed commission exercises review over taxes, but not bond issues, is gone into, revealing various good results, particularly in establishing better budget systems and in making advisory recommendations. The lack of review over borrowing, however, leaves a large loophole.

All three plans are criticized as devices for redistributing political power, rather than for the healthy financial functioning of localities. As a better means for the latter end, Dr. Kilpatrick outlines a plan of state cooperation in local review, under the following heads:

1. State responsibility for local fiscal procedure
2. Local tax and bond review
3. Participation of taxpayers and citizens
4. State participation by staff services and advice
5. State appellate review of disputed cases
6. Reporting of financial information
7. Account standards and audit reports
8. Long-term planning of improvements
9. Stabilization of tax trends
10. Redefinition of taxing power
11. Supervision of the supervisors
12. Local initiative and responsibility

[1] See department of Municipal and Civic Publications.
[2] See also the article "Has the Indiana Plan Been a Success?" in *National Municipal Review* for February, 1932.

Present-Day Swimming Pools Achieve High Standards of Design and Operation—I

THE ALLEGHENY COUNTY DEVELOPMENT
The deep pool, above; below, a corner of the large shallow area

OUTDOOR swimming pools recently completed and now in successful operation in many parts of the country have notable characteristics in common, all of them in distinct contrast with those of pools built a decade ago. To name but a few: professional standards of design are recognized, and where the municipal department or other authority does not have competent designing engineers on its own staff, it employs them; topography is consciously utilized to add to the attractiveness of appearance and efficiency of use of the plant; landscape design for the enhancement of the setting, and architectural design for the bathhouse structures, are given careful attention; and, most notable of all, permanent materials and construction work are employed and exacting health requirements are met in the matter of sanitation.

In South Park, Allegheny County, Pa.

One of the most prominent recently-completed projects embodying all these characteristics is South Park pool, built and operated under direction of the Bureau of Parks, Allegheny County, Pa. Here, exceptional conditions prevailed, and several new problems have been solved in a satisfactory manner. The quiet and unspoiled beauty of the valley selected for the site was the inspiration of experiments into the field of naturalistic design, with the result that there were developed a group of small lakes in a setting of stone slabs and cliffs. Waterfalls dash down over the stones with all the charm of mountain streams.

The total water area is 750 x 300 feet. The four pools are of graduated depths and are so planned as to take care of the maximium number of people with minimum congestion. The deepest pool, 4 to 10 feet in depth, is 115 x 165 feet, and meets the requirements for professional swimming meets. Owing to the topography of the valley, it lies three feet lower than the other pools and is separated from them by ledges of stone. A large cascade supplies filtered water. Underwater lighting illumines its deepest parts. Stratified rock surrounds it, with projecting cliffs, natural in effect, placed to be used for diving into the deep water. Both location and planning preclude the use of this pool by any except the most experienced swimmers. The wading pool for small children is completely enclosed for safety, and is very shallow. There is a pool 375 x 100 feet, with a depth of 36 inches. A 45 x 80-foot circular splash pool 4 feet, 6 inches deep, for shallow diving and water slides, is located at one end of this pool and is surrounded by safety steps. Irregularly shaped 5-inch sandstone coping borders all pools, and the decks are of flagstones blending harmoniously into the adjoining cliffs. The interstices between these stones are grassed. Batteries of floodlights make night swimming safe and pleasant. A development which adds greatly to the pleasure of bathers is a sand beach 65 x 155 feet. Entrance and exit here are through a footbath and a battery of showers.

The bathhouse, of native stone, is patterned after the fine example of Pennsylvania Colonial style found in the Stone Manse, of Whiskey Rebellion fame. The simplicity and beauty of style and the mellow stone pattern are a heritage from the earliest pioneers. The building capacity is 2,000 to 3,000 people. On one record day in 1931, 15,000 people were accommodated. Ample chlorination and filter facilities, with a 14-hour turnover, have been provided, and even with heavy use, the standards of sanitation are higher than those set by the State Health Department. The chlorinators are from Wallace and Tiernan and the filters from Wm. B. Scaife.

After a complete season of use, the pool has more than justified expectations, according to Paul B. Riis, Director of the Department of County Parks. The setting planned chiefly for its appearance has proved highly practical, since it provides unlimited seating space for swimmers and sunbathers.

In Wheaton, Ill.

The $50,000 swimming pool in Wheaton, Ill., has been in use longer. It was financed by a park district bond issue in the spring of 1928 and built to meet what was felt to be a definite demand. Not only the construction history, but also the financial history, which now extends back for four sea-

sons, as given by J. D. L. Langan, Secretary of the Park District, is worthy of notice. After decision had been made that a pool 75 x 120 feet was required and the type had been decided upon, an engineering contract was let to Wesley Bintz* of Lansing, Mich., consulting engineer and pool designer, for the preparations of plans and specifications and supervision of construction. The contract price was $38,500; filters, $3,885; lockers, $1,100; suits and towels, $1,700; plumbing and electrical work, $3,900; special sash, $1,000.

The construction work was rapid, and the pool was opened on July 15. Over 17,500 people entered the pool in the six remaining weeks of that season, and receipts amounted to $4,600. In 1929, 27,800 persons paid $7,200 for use of the pool. During the following season, 32,600 persons paid $7,800, and in 1931, 40,200 patrons brought an income of $8,400.

The expenditures for operation for the four seasons were $3,800, $5,300, $5,800, and $6,000, a balance remaining each year after a 3 per cent deduction had been made for depreciation. As will be noted, this reached $2,400 in 1931. Bonds issued by the Park Board do not have to be retired from the income of the pool, but instead are retired by tax money received by the Board treasury from the annual apportionment of the taxes. Because of this feature the income from the swimming pool has been used to improve the surrounding park area and to complete other minor public works which seemed necessary. Since the development represents primarily an investment in health and recreation, the charges for use are reasonable. Individual tickets are 50 cents, 10-swim tickets for adults are $2.50, for children $1.50. During 1931, 6,300 school children were admitted free on special-use days. Analysis of income shows that the average swim in 1928 cost 26 cents plus, and in 1931, 21 minus. Safety has been aimed at in construction, operation and sanitation. Periodic tests of the water are made and the results posted as an advertisement of the pool. During the four years there has been but one accident of consequence, and no drowning.

THE WASHINGTON POOL

Showing two of the swimming areas and several of the incidental buildings.

In Washington

The new Crystal Pool in Washington, D. C., is situated in Glen Echo Park on a slight plateau in the valley of the Potomac. There are three separate pool developments, a diving basin 35 x 50 feet, a pool 90 x 140 feet, and a children's pool 15 x 35. There are 12,000 square feet of decks and walks, and a sand beach 10,000 square feet in area. This is separated from the pools by a Cyclone fence. There is no means of access to the water except through a shower 20 feet long.

A ground slope downward from the pool occasioned the development of the locker rooms so that their floor level is 10 feet below the pool deck. The entrance lobby is at this lower level, and is beautifully and appropriately finished and furnished. A filter room is also located on the lower level.

THE WHEATON POOL

The exterior is of typical Bintz design. The lower view gives an idea of the water area and some of the play equipment.

* Public officials and others interested in the cost, operation, expenses, income, and other details relating to swimming pools in use, may write Wesley Bintz, Lansing, Mich., for a résumé of reports on 1931 operations of a score of pools, mostly municipal, of his design. The 1931 Municipal Index also contains statistical data on a large group of pools.

The roofs of the various swimming pool buildings are of Spanish tile and the walls of stucco. The painting is in soft tones of terra cottas and warm yellows. The whole plant is surrounded by great trees. Over the locker rooms is a grandstand for spectators at swimming meets. On a still lower level is a women's rest room for park patrons. There are 150 men's lockers and 800 women's lockers of Lyon Metal Products Co. manufacture. These are finished in soft French grey. Between each two rows of lockers in the women's room are dressing booths protected with colored waterproof curtains.

The filter plant consists of three 10½-foot diameter closed type pressure filters, which, with the pumping facilities, have a capacity of approximately 1,000 gallons per minute. Dry chemical feeders of the Wallace and Tiernan type, electrically controlled, are directly over the control pit. A Wallace and Tiernan M.S.V.M. chlorinator is used. There is also a small pump feeding the showers, and a constant-play fountain in one of the pools. Vacuum cleaner outlets connect with the main pumps. The circulation is automatically controlled by a system licensed under patents granted to Wayne A. Becker, of the firm of Alexander, Becker and Schoeppe, of Philadelphia, the firm of designing and construction engineers who handled the work. Approximately 1,500,000 gallons of clear, sterilized water per day is provided.

The separate diving basin may be emptied for cleaning as often as is desirable; water from it is stored in the large pool and returned by gravity with little loss of time. Like the other pools described, this development has complete surface and under water lighting.

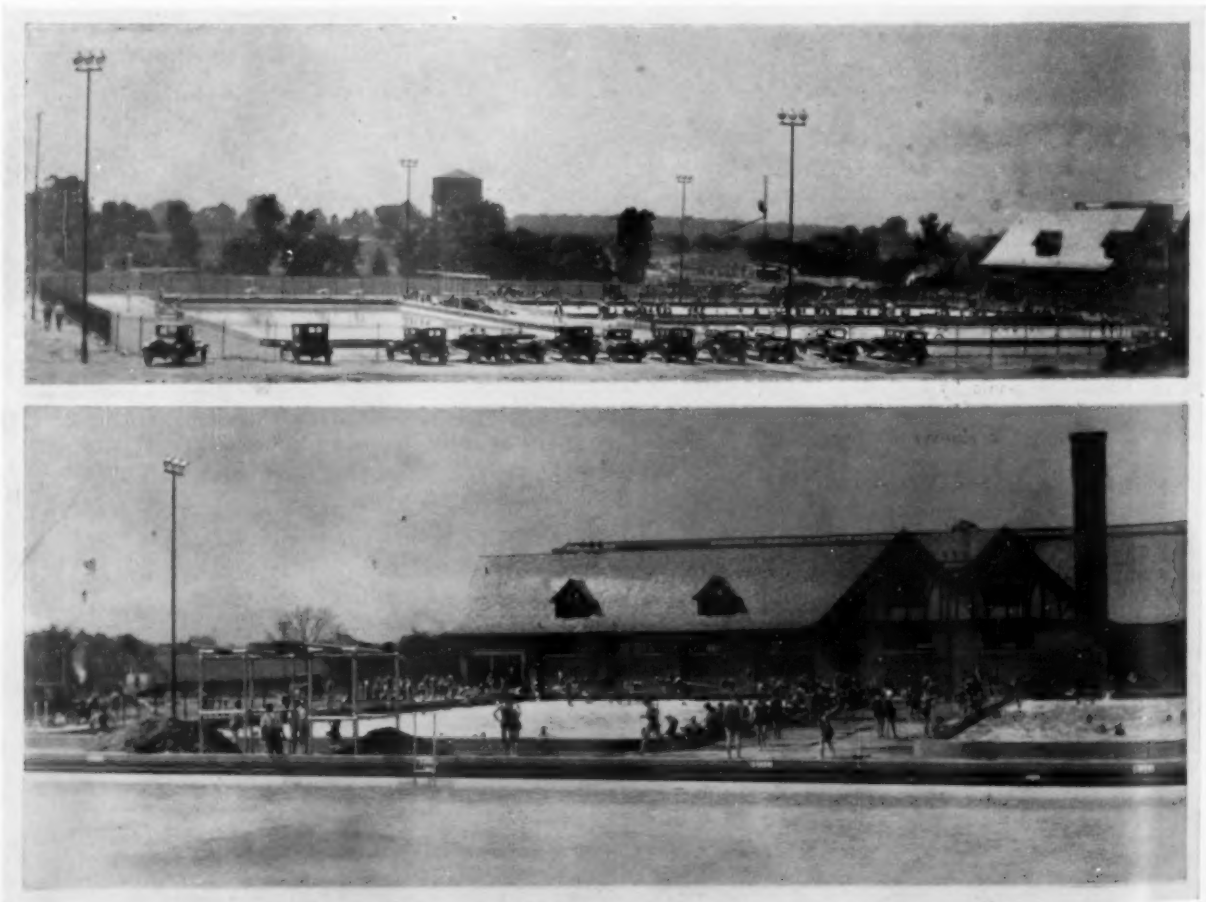
River Rouge Pool, Detroit

The new plant in River Rouge Park, Detroit's first outdoor pool development, is also designed with the water area in three units. It was said by a prominent local authoritiy at the dedication services that nowhere in the world is there to be found another such group of Olympic standard size pools with more modern and efficient equipment. Each pool is 70 x 165 feet. One is 3 to 5 feet in depth; one is 4 to 6 feet; and the exhibition pool is graded in depth from 4 to 12 feet, and may be used for fourteen 5-foot swimming lanes, or ten 7-foot lanes.

Into the construction went 4,000 cubic yards of concrete and 175 tons of reinforced steel. Their normal daily capacity is 2,800 bathers. The water supply is from the city mains, recirculated, filtered and sterilized every eight hours, or oftener. The lighting system provides for complete surface and submarine illumination.

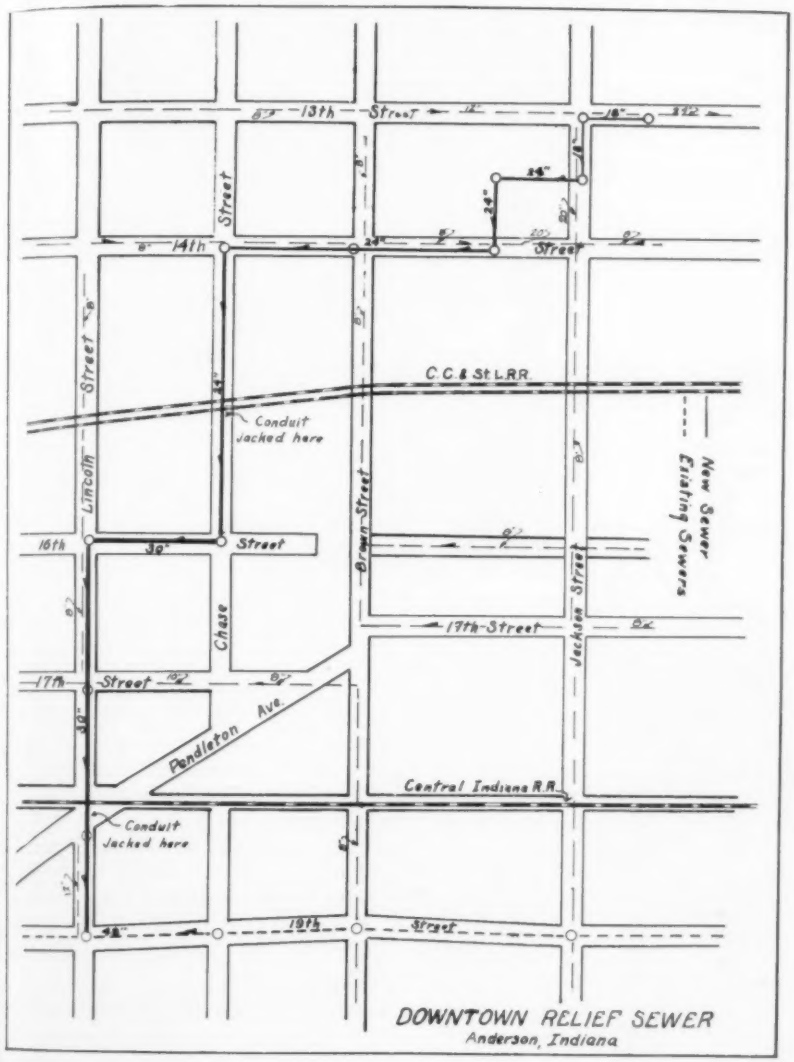
This municipal enterprise was constructed and is operated by the Department of Parks and Boulevards, of which H. W. Busch is Commissioner, and represents an expenditure of $323,623, of which $158,500 covers the cost of bathhouse provisions.

The bathhouse is of fire-resistant construction, and is 58 x 240 feet, with 128 individual dressing rooms, 1,050 lockers and 22 shower stalls, for women and girls; and 1,610 lockers and 50 showers for men and boys. River Rouge Park, the setting for this development, comprises over 1,200 acres and has been effectively developed for scenic and active play use.



THE DETROIT POOL GROUP AND BATHHOUSE

No Slow Deliveries—No Broken Springs During This Public Improvement



A Relief Storm Sewer Laid in Conduit Jacked Under Two Railroads and a Main Thoroughfare

By H. L. GWINNUP
City Engineer, Anderson, Ind.

ANDERSON is a busy industrial city of approximately 40,000 in population, situated in the center of production, distribution and population of the United States. It has always maintained an attitude of progressiveness with regard to public works. Today, 7 public parks, 64 miles of paved streets, 103 miles of concrete sidewalks, and 91 miles of sewers stand as the result of a well-balanced program of public improvements which has been followed for years.

Last summer, Anderson took advantage of the lull in other lines of activity to install a storm sewer, for the purpose of relieving several main downtown sewers which were overloaded at times of exceptionally heavy rainfall; also to remedy conditions in three localities in the central residential district where rainfalls of severe intensity occasionally flooded low areas and the cellars of adjacent residences.

The Sewer Route

The new sewer was planned to pass through these areas and also to serve as a new outlet for certain lines of existing sewers of this district, which had as their outlet, sewers serving the downtown district. A route which met these needs, and which is indicated on the accompanying map of the district, is as follows: starting at the upstream and one-half block west of Meridian Street on 13th Street, thence west one-half block to Jackson Street; south one-half block to the alley between 13th and 14th Streets; west one-half block to the first alley west of Jackson Street; south one-half block to 14th Street; west on 14th Street to Chase Street; south on Chase Street to 16th Street; west on 16th Street to Lincoln Street; and south on Lincoln to an outlet in an existing 48-inch sewer on 19.h Street.

This routing made it possible to cut off an existing 8-inch and 10-inch sewer at the intersection of 17th and Lincoln Streets; also three 8-inch sewers at the intersection of 14th and Brown Streets; also one 8-inch and one 20-inch sewer on 14th Street at the intersection of the first alley west of Jackson Street and intercepting the same 20-inch sewer again on Jackson Street, at the alley between 13th and 14th Streets.

Jacking for Under-Track Portions

In order to follow this route, it was necessary to carry the sewer under two railroad lines—the single track of

the Central Indiana at its intersection with Pendleton Avenue, and the tracks of the Big Four Railroad, which, with several switches at the crossing point, consisted of five tracks. For construction under the tracks, the railroads demanded a method of procedure which would not interfere with the operation of trains on the tracks overhead, and recommended that the Armco jacking method be used to install a conduit of corrugated iron pipe in which the sewer could be laid. This method not only promised complete freedom from interference with train operations, but also provided protection to the sewer from the vibration of the heavy traffic passing overhead — a safety feature which appealed strongly to both city officials and the railroad officials of both lines.

The proposed sewer crossed under Pendleton Avenue at its intersection with the Central Indiana track. Since Pendleton Avenue is one of the city's main thoroughfares, as well as forming part of the city's portion of State Routes 67 and 69, it carries heavy city and inter-city traffic. Installing the sewer by the open trench method would have necessitated detouring this traffic, which would have been considerably inconvenienced if such measures had been put into effect. Also, open trenching would have necessitated tearing up the brick street surface, excavating a trench 15 feet deep, backfilling, maintaining a settling backfill and replacing the pavement. These objections could be overcome by continuing the jacking under the railroad under the street also, a total distance of 74 feet. With these advantages to be gained, the jacking method was adopted for installing the under-the-street portion of the sewer also.

THE WORKING TRENCH
Showing the jacking in progress

JACKING UNDER THE SINGLE TRACK
Pendleton Avenue, showing the hand derrick for elevating the spoil

Grade and line for the portions of the sewer under the street and railway tracks were first determined, because the conduits for these portions of the line were to be installed before other operations were started. A working trench, well sheathed to prevent cave-ins, was dug to the required depth. Guide timbers, set to the required line and grade, were placed and securely anchored, and a backstop to receive the back pressure of the jacks was prepared at the rear end of the trench. These arrangements, together with the placing of a small hand derrick for elevating the spoil from the trench, completed the preparations for jacking.

The soil at this location was of a clayey nature which arched readily, and good progress was made in jacking the 42-inch pipe, which was required to provide an opening sufficiently large for the 30-inch pipe used on this portion of the line. At no time during the time of installation was railway or street traffic interfered with. In fact, since all surface operations were confined to the foot of the railroad embankment at the north side of the street, very few passing motorists were even aware that construction work of any kind was going on under the street on which they were traveling.

For the crossing under the Big Four tracks, a different set of conditions was encountered. Here the soil was of a pronounced gravelly nature. Sheathing the working trenches was necessary here also. Only a 36-inch corrugated iron conduit was required, however, for the size of the sewer at this point was 24 inches.

Owing to the gravelly nature of the soil, which allowed it to bind tightly against the pipe and impede its forward progress, it was impossible to jack the entire 74 feet re-

quired to pass under the tracks from one set-up. This necessitated digging another approach trench on the other side of the track and jacking from that direction until a meeting of the two lines was successfully effected.

Laying the Sewer

Laying the sewer, which was of concrete pipe manufactured at a local plant, was started at the outlet end. An Austin trench machine was used to excavate the trench. Backfill was made as the laying progressed, by means of an Austin backfiller. When the conduits already in place were encountered, the pipe was laid and the line continued on the other side. For the first 1,299 feet, the pipe used was of 30-inch diameter. This was followed by 1,757 feet of 24-inch, with 352 feet of 18-inch completing the required distance.

The Satisfactory Results

In the manner above described, Anderson completed another addition to its program of public improvements in a way which has met the approval of all concerned. Property owners of the area which the sewer serves now have sewer facilities ample to protect their property from overflow, and the overloading of sewers in adjoining districts has been guarded against. By choosing the jacking method of installing portions of the sewer passing under railroads and streets, the railroads were spared the loss occasioned by slow orders, and the traveling public did not suffer the inconvenience of a detour and a marred pavement.

The entire improvement was carried out under the direction of the writer. Weiss & Horan, of Anderson, were the contractors for the work. The installation of the conduits under the streets and railroads was sublet to The W. Q. O'Neall Co., of Crawfordsville, Ind., and placed by its service department under the direction of C. R. Winks, construction superintendent.

Utah Supreme Court Hits Diversion of Funds

By E. F. RAWCLIFFE

MANY attempts have been made recently in cities and states all over the country to divert, for unemployment relief, money appropriated for other purposes. Because of the frequent agitation in times of stress for such use of special public funds, a recent ruling of the Utah Supreme Court, which stamped diversion as illegal, is of particular interest.

The decision was made on a writ of prohibition asked by a local taxpayer to restrain Salt Lake City officials from awarding contracts for sewer construction in which certain special provisions were made for the benefit of the city's unemployed workmen. The contracts required, among other things, that all work be done by hand labor, that only local men be employed, and that crews be rotated so that as many men as possible could be given work. The city anticipated that these provisions would increase the cost of the project about 10 per cent.

The ruling point in the decision was that the law and the constitution provide that money appropriated for one purpose cannot be diverted to other uses. The opinion held that a bond issue of $600,000 passed a few months previously provided funds for the construction of a storm sewer; but that in view of the provisions for hand labor and rotation of labor in the contracts, the cost would be about $55,000 more than if the jobs were awarded by straight contract. Although recognizing that the motives in letting work on the basis outlined were of the highest, the Court held that in effect $55,000 of the bond issue was going, not to build a storm sewer, but for charitable purposes. This was directly opposed to the principle that money cannot be diverted from the purpose for which it is raised.

In the Court's decision exception also was taken to the provision specifying wages to be paid and requiring that only Salt Lake City men who were heads of families should be employed. In these regards the opinion reads: "There is in this state no expressed or implied power conferred upon a municipality which directly or by implication authorizes a city to dictate to a contractor the wages he shall pay his employees. . . . The city in letting the contract has imposed conditions that preference be given to Salt Lake City men who are heads of families. It is obvious that by so doing the city imposed a preference not embraced nor included in the statutes and contrary to the statutes. These provisions of the contract cannot be sustained."

Noteworthy Unemployment Efforts

Salt Lake City has made noteworthy efforts to provide work for its jobless citizens through the present period of economic stress. Last summer, citizens voted favorably on a $2,000,000 bond issue, urged as an employment measure, to provide needed additional water supply for the city. When the need for further employment became apparent in the fall, the Council decided to act on a proposal of the Mayor's Advisory Committee on Unemployment to enlarge the storm-sewer system, as a means of preventing recurring floods in the lower portions of the city.

Plans were drawn for the improvement and estimates were made, and the project was submitted to the voters at a special election held on October 27 last year. Excellent publicity was given to the proposal in all of the newspapers, and even before the election it was apparent that public sentiment favored the construction. In anticipation of a favorable vote, different units of the sewer project were advertised and on some of them bids were taken even before the election, so that work might be put under way at the earliest possible moment.

The first contract was awarded on November 4, just eight days after the election, which was carried by a two-to-one majority. Other small contracts were awarded in the succeeding week, but before the major work could be gotten under way, suits were filed which stopped construction.

Following the decision of the State Court, given on January 23, the work was immediately readvertised. New bids were taken with the objectionable features of the contracts eliminated, and the contracts were re-awarded. Work is being carried on through the winter months.

Many other smaller projects have been carried out in the past few months to keep men at work. In addition, a canvass was made of every home in the city to locate home improvement jobs.

On much of the small work done for the city there were no appropriations, so the men were paid in work certificates. These are exchangeable at city warehouses for food, clothing and other necessities obtained, for the most part, without cost to the city.

Improving Water-Works Service with an Elevated Storage Tank

The Effect of the New 1,500,000 Gallon Tank Was Felt Immediately in the Indianapolis Water System

THE city of Indianapolis, Ind., and its suburbs, embracing a population of 373,500 living in an area of 54.15 square miles, are served by the Indianapolis Water Co. The company's distribution system consists of 655 miles of mains ranging from 4 to 42 inches in diameter, pumping equipment with a capacity of 202,500,000 gallons per day and 25,000,000 gallons of suction storage. The pumps are of both the centrifugal and the reciprocating type and are driven by hydraulic, steam and electric power. A portion of the water supply is secured from deep wells, and the remainder is pumped from the White River, about 1.75 miles from the business district. Water from the river is filtered before it enters the distribution system.

According to a report of W. C. Mabee, Chief Engineer of the Indianapolis Water Co., the company serves 71,786 customers. The normal per capita consumption of water is 92.1 gallons per day; the average daily consumption is 34,500,000 gallons; and the maximum daily consumption is 55,670,000 gallons. There are 5,889 fire hydrants in the system.

Pressure Conditions

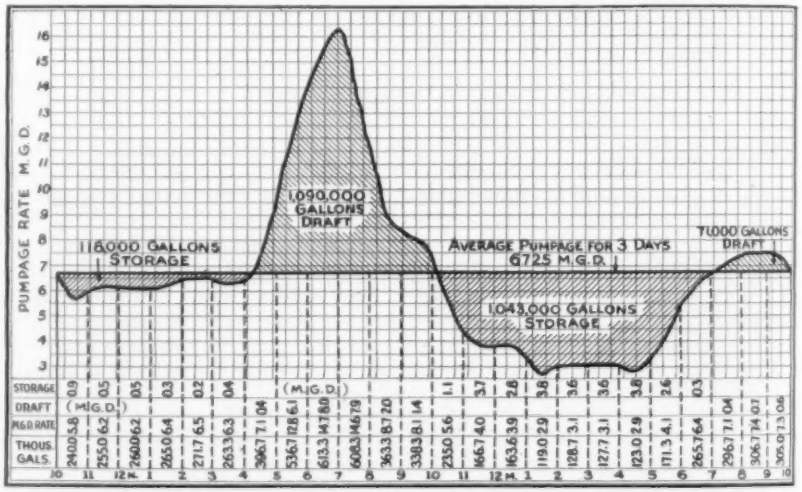
Previous to 1931, the eastern portion of the city, with a population of 64,000, was supplied from the high-service station at pressures varying from 85 to 130 pounds. When the summer load reached the point at which this station was unable to give satisfactory service at the extremities of the system, the booster station serving 50,000 people of this district was put into service.

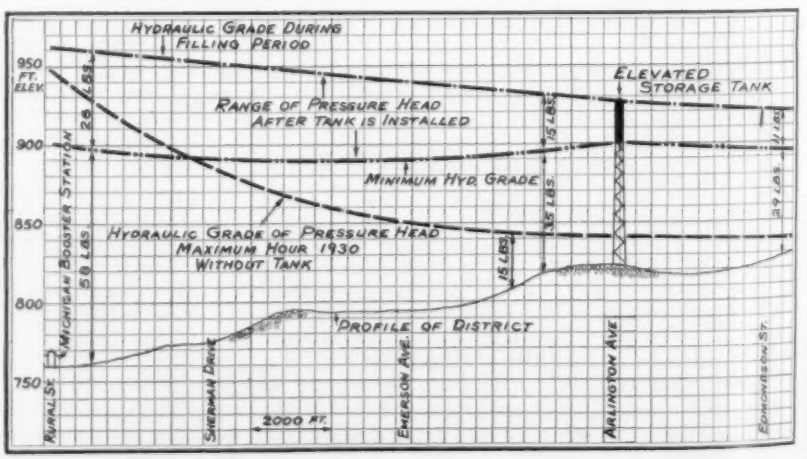
In 1930, there were 123 days when the booster station operated at rates from 6 to 16 million gallons daily. Below 6 million gallons daily, the booster pumps were not necessary, for the friction losses in the system were not excessive. After making a complete survey of this situation, the company decided to make several improvements in the distribution system, including a 1,500,000-gallon radial-cone bottom elevated tank. The first diagram shows the curve developed to determine the amount of elevated storage required, and the second illustration shows the hydraulic grade curve developed to determine the best location for the elevated storage.

The tank was erected by a crew from the Chicago Bridge and Iron Works. Construction was started on March 28, 1931, and the tank was officially placed in service on July 2, 1931. The height to the bottom of the tank is 72 feet, and the diameter of the tank 104 feet. The distance between the upper and lower water levels is only 25 feet.

Benefits of Tank Shown within Two Weeks

On July 15, 1931, during a period of excessively heavy draft, a series of pressure observations were made during

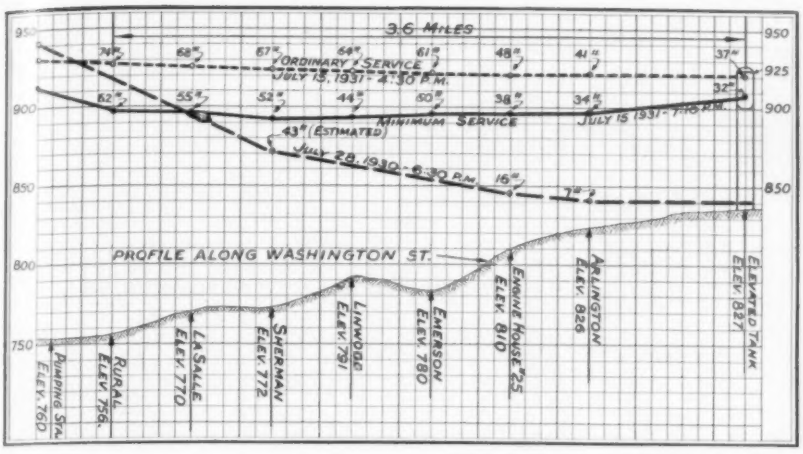




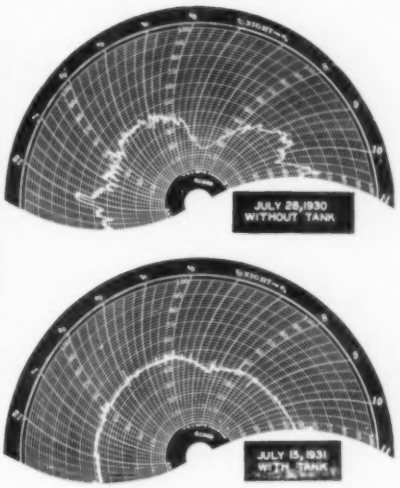
PUMPAGE RATE

During periods of peak draft in the Indianapolis water system in 1930 (above)

Effect of elevated storage on the hydraulic grade in the Indianapolis water system (below)



THE HYDRAULIC GRADE LINES
Before and after the installation of the Indianapolis tank



PRESSURE CHARTS
Recorded in Engine House 25

the peak-load hours. These measurements were made to determine the effect of the elevated tank as reflected by the character of service furnished the water consumers in the eastern part of Indianapolis, known as the Irvington district. Pressure during peak-load hours has been maintained at a point that insures ample service with adequate volume.

While the tank was placed in service on July 2 with a connection into the East 10th Street main, only partial results were obtained until a connection was made on July 15 into the principal feeder main in Washington Street. The draft in this district occasioned by extremely hot weather had already established a heavy pumpage record on the Michigan booster station before the tank was put in service. On June 19, 1931, between 6 and 7 P. M., the electric pumping equipment was operated at its maximum rate of 19 million gallons daily, leaving no reserve machinery available for any possible breakdown or other interruptions in service. The pressures prevailing in the district were not quite so low as they were during a similar period of dry weather in 1930.

On July 15, 1931, the booster station pumped at a maximum rate of 9 million gallons daily between 6 and 7 P. M., with 10 million gallons daily pumping capacity in reserve. The tank during that hour was discharging at a rate in excess of 10 million gallons daily and maintaining a relatively flat hydraulic grade over the entire district.

This desirable result was made possible by the efficient use of the gridiron system in reducing high velocities and consequent high friction head losses. Losses were kept at a minimum by reason of reduced velocities and shorter distances between sources of pressure and areas of consumption. The district was being fed at one end by the booster station and at the other end by the elevated tank.

The tank provided better service by maintaining higher and more adequate pressure in regions of greatest demand, making more water available for withdrawal from the system, which, without the tank, would not otherwise have been available. This is illustrated by the hydraulic grade line shown in the third diagram, marked July 28, 1930, as compared with the line marked July 15, 1931, before and after the tank was in service.

Another favorable result of the tank installation has been the elimination of violent changes in pressure due to unusual draft by large consumers. An examination of the pressure charts from Engine House No. 25, which are reproduced, clearly shows that the tank acts as a stabilizer by automatically supplying the demand for volume and avoiding the time lag required by the pumps. This results in a dampening of the objectionable fluctuation in pressure.

By supplying a substantial contribution to the arterial system during peak loads, the tank reduces the maximum hourly rate of both primary and secondary pumpage. At the time of this test the tank actually furnished one-third of the demand of the entire high-pressure district supplying 64,000 people.

The reduction of the maximum pumping demand at the booster station has resulted in a benefit to the suction side of the station by permitting a higher pressure due to lessened velocity in the suction pipes. The region on the discharge side is benefited by more uniform pressure.

The static head maintained by the water stored in the tank furnished adequate pressure and volume in the district formerly restricted by its higher elevation and residual low pressure during peak loads. It is now possible to extend adequate service into the growing section lying north and east of the elevated tank.

Another advantage of the improvement which the Indianapolis Water Co. has made is that the city it serves has a very favorable insurance rating. This gives the residents a considerable saving over what they would have to pay if the available water service resulted in a less favorable rating.

The Irvington tank at Indianapolis is equipped with a water-level indicator and an altitude valve to help the plant superintendent realize the full benefit of the tank. The water-level indicator transmits the position of the water in the tank to the Fall Creek pumping station 5 miles distant over leased wires. A small building at the base of the tank riser houses the instruments. This building is heated in winter with several small electric unit heaters.

The tank rides on the system, controlled automatically by an altitude valve. The valve is so designed that it will close from the open position at any given elevation in the tank and will automatically open with a drop in pressure of about 5 pounds as desired.

Reorganizing a Street Sanitation Department

By **WILBUR H. WINSHIP**
Street Commissioner, Indianapolis, Ind.

A LITTLE over a year ago budgets for all divisions in the Department of Public Works of Indianapolis, were cut to about 40 per cent of the former allotments. These cuts were especially heavy in the division of Street Sanitation. In order to meet the demands of a modern Indianapolis for efficient public service, a well-balanced, carefully planned, rigidly controlled organization had to be created. It was decided first to establish a five-day, forty-hour week, and then to familiarize ourselves with the problem to be solved.

A control map showing all the paved streets of the city, together with a list of these streets, giving the distances to 0.1-mile, the location of water plugs, and all other information of value to the Street Sanitation Division, were prepared in the main office. Similar maps and data were prepared for the inspectors, sweeper-men, and flusher crews. The total mileage was next computed, and from this total was deducted 40 miles of streets and alleys comprising the "mile square," or the central business district, which is cleaned daily. The remainder of the surrounding territory was divided into seven working units of practically equal capacity.

Two of the districts are served by a power sweeper, which gives day and night service. The crews are under the direct supervision of the Assistant Commissioner of the Division of Street Sanitation. The five hand crews are each supervised by an inspector.

All work starts at the city boundary line, advancing daily from all directions towards the business area, or central district, where contact is made on the last day of the week. This system makes it possible for the center of the city, where most of the public buildings are located, to look its best over Sunday.

The crew consists of eleven laborers, two trucks, two helpers, and one flusher. They clean one section of about 175 city blocks, equal to 35 gutter miles, daily. All street accumulations are flushed into the gutters during the night; early in the morning the panners and broomers follow, and later the trucks haul the dirt to the dumps. Each crew is responsible to its inspector, who in turn is responsible to the Assistant Commissioner, who confers with the Commissioner daily, and receives orders direct from him.

NOTICE!
VIOLATION OF CITY ORDINANCE
Sec. 602—TRANSPORTING MATERIAL IN LEAKY WAGONS OR VESSELS. It shall be unlawful for any person, firm or corporation to transport over or along any street, alley or public place any loose material, liquid or substance of any kind in alley or public place any loose material, liquid which permit such materials, liquids or substances to drop, spill, or scatter upon such street, alley or public place; and it shall be unlawful for any person, firm or corporation to suffer or permit any such street, alley or public place, substance to drop, spill or scatter upon any such street, alley or public place, from any vehicle, vessel or container while such materials, liquids or substances are being transported over or along any such street, alley or public place. Any person violating any of the provisions of this section shall, on conviction, be fined in any sum not exceeding fifty dollars.
LAST NOTICE!
No further notice will be served.
STREET COMMISSIONER.
NOTICE
VIOLATION OF CITY ORDINANCE
Sec. 600—DEPOSITING FILTH IN STREETS. It shall be unlawful for any person to cast or deposit upon any street, alley, sidewalk or public place any dirt, filth, offal, noisome or filthy liquids, carcasses of dead animals, vegetable matter, garbage, ashes, shavings, straw, paper, scraps or coils of wire or iron, boards or timbers, rags, tacks, nails, glass, broken tin, tin cans, metal hoops or other refuse matter of any kind. Any person violating any of the provisions of this section shall, on conviction, be fined in any sum not exceeding fifty dollars.
LAST NOTICE!
No further notice will be served.
STREET COMMISSIONER.

NOTICES SERVED ON VIOLATORS OF SANITARY ORDINANCES IN INDIANAPOLIS

Complete Records Available

At the close of the day each inspector files his daily report at the office. On the face side of the blanks is the time record, showing the number of pieces of apparatus, names of operators, helpers and laborers, their addresses, and the time that each worked.

In this respect all time reports in all divisions are alike. The reverse side, however, differs according to the nature of the service. Thus, the power sweeper operator reports speedometer readings at the start and finish; distance cleaned, and cubic yards dumped; flusher loads in 1,000-gallon units, and the district flushed; truck drivers report the loading and dumping places and the cubic yards hauled; panners and broomers report the streets cleaned, in gutter miles.

This control is simple, efficient and absolute. Primary control is of course through the daily reports, which are carefully checked. A second control is exercised through the Complaint Division in the main office, where all com-

TYPICAL FORMS USED FOR STREET-CLEANING RECORDS IN INDIANAPOLIS

plaints are numerically registered for each divisional service. Comparing the serial numbers of the complaints for a certain period of time in a division with those of a corresponding period, gives a rough idea as to the success or failure of the work of that division.

Critical analysis generally suggests the remedy for faulty conditions. Undue fluctuations are reported to the Street Commissioner, at once. For instance, if the records show that in the Sewer Division, despite reported basin cleaning, and heavy hauling, the basins are full, the cause is immediately investigated. Thus we have found that residents, after edging their lawns, had cast grass and dirt into the gutters; in some cases, actually crowding the accumulations into the basins and inlets. Observations of the Commissioner on frequent inspection trips, and subsequent consultations with his divisional assistants, complete the system of control.

Preventive Educational Work

Many people who thoughtlessly litter up public thoroughfares, are easily dissuaded if properly approached. To aid in this work, thousands of cards were printed quoting the laws and ordinances together with the penalties for violations. The cards are handed to violators by the inspectors, who courteously give a little good-natured talk along with the cards. While this has not been 100 per cent successful, fair progress is being made, with hope for further improvement.

For flexibility, mobility, and efficiency, as it exists, the organization is not to be underestimated. We have, in emergencies, covered every section of the city in 30 minutes from the time the order to mobilize was issued. We accomplish this by using trucks and men from all divisions of the Street or Public Works Department. One occasion was a threatened flood, when the dams began to crumble under heavy water pressure. Another, early in 1931, was when sleet and slush clogged up the inlets, flooding the streets. Mobilization is effected by dividing the districts and handing each driver, as he appears, a print of the sector he is to patrol. He is instructed to take charge of a certain number of men and bring time records and reports to the office when through.

Costs and Results

The Division of Street Sanitation under the old system had been endowed with as much as $180,000 per year, when the city had about one-half of its present mileage of paved streets. The appropriation for 1930 figured only $97,800, with which it was required to clean more than 600 miles of streets and alleys. During the entire season, not more than fifteen complaints were received. Investigation proved these complaints to be unfounded. In most instances, conditions could not be relieved, because excavating contractors at the time were doing heavy trucking in the vicinity. The results obtained in 1930 and 1931 were highly satisfactory, considering that the field forces were new and that the inspectors had to become familiar with the system installed.

ACKNOWLEDGEMENT.—From a paper presented before the International Association of Public Works Officials.

TUESDAY

A Bridge Approach in Philadelphia Resurfaced in Four Days

FAILURE of a local Park Commission to maintain the east approach to the Spring Garden Street Bridge in Philadelphia led the Keystone Automobile Club to publish an editorial criticizing the Park Commission. This editorial was released to all Philadelphia newspapers, which carried news stories demanding action. The same day the Bureau of Highways was given orders by the Mayor to take over the roadway from the Park Commission and improve it immediately. The interesting series of photographs reproduced with this article through the courtesy of the Keystone Automobile Club show the progress of the work on Tuesday, Wednesday, Thursday and Friday, and traffic using the roadway on Saturday.

On Tuesday, November 3, bids were advertised for and plans formulated. On Wednesday morning workmen began tearing up the old roadway and traffic was detoured. Also on Wednesday the workmen began to pour concrete. On Thursday the concreting was finished and the asphalt surface partly in place. On Friday at 5:30 P. M. the job was finished. On Saturday motorists were gliding over a smooth asphalt surface of the most modern type.

The total cost of this repaving was estimated by engineers to be less than $5,000. The speed with which the work was done was virtually unprecedented.

The concrete mix used was a substitute equal-cost mix to replace the customary Bureau of Highways high early strength 1:3:6 base mix. This substitute mix, according to a report of Joseph Firth, Assistant Engineer, Materials Division, Bureau of Highways, has the proportions of 1:2:3.65, using an absolute moisture content of 5 gallons per sack of cement, and an admixture of 2 cubic feet of

WEDNESDAY

THURSDAY

diatomaceous silica per cubic yard. This made a stiff but workable mix which set up rapidly and permitted the wearing surface to be laid 36 hours after placing the concrete. Cylinders from this concrete gave an average compressive strength in pounds per square inch of 1,285 pounds in 48 hours, and 4,115 pounds in 28 days. A total of 296 cubic yards of concrete was laid.

The wearing surface was made of the regular 1½-inch sheet asphalt on 1 inch of binder and covered approximately 1,570 square yards, including adjustments and certain areas where concrete was not laid, but where top and binder were placed on old granite block.

FRIDAY

SATURDAY

Prequalification vs. Bonding of Contractors

CONTRACT surety bonds as a means of protecting municipalities from the expense and delay caused by defaulted or abandoned contracts are seriously questiontd in a recent report of the New York State Conference of Mayors and Other Municipal Officials, giving the results of a study made by Clarence H. Girard, of the School of Citizenship of Syracuse University, and supervised by the Mayors' Conference Bureau of Training and Research. The report states:

"In its present state the contract surety bond is not an adequate security for public improvements. It does not protect the municipality from many indirect losses caused by the failure of the contractor to carry out the covenants of the contract; and the courts provide too easy a method for the surety companies to escape their liabilities. In fact, it can be stated that the present procedure followed by surety agents in bonding irresponsible contractors is detrimental to the municipality."

The substitution of a qualifying procedure for contractors, determining their responsibility in advance of receiving bids, it is stated in the report, would reduce the possibilities of default to a minimum, leaving as the chief causes such unforeseen hazards as storms, strikes, riots, etc. "Defaults due to these factors occur so infrequently that they can be absorbed in the tax levy. This would place a lesser burden upon the taxpayers than that which they now bear through the payment of premiums to surety companies."

To supplement the prequalifying procedure, cities can continue the practice of retaining certain sums from the monthly payments to the contractor. Where this practice is combined with the requirement of a performance bond, the retained amounts are said to protect the surety companies rather than the municipalities, but the report says: "If the retainage system were administered in a more orderly and logical manner, it is believed that it would provide adequate security in case of default of a contractor."

One-Lane Pavements in Two Widely Separated Counties

Iroquois County, Illinois, and Kent County, Maryland, Follow Similar Local Road-Building Program

By M. D. CATTON
Highway Engineer,
Portland Cement Association

THE improvement of state highway systems has progressed in most states to the point where a large percentage of the population is able to appreciate the value of good roads from first-hand knowledge. They know the advantages of being able to use their automobiles at all times of the year, and as their appreciation of good roads increases, their desire for more good roads likewise increases. Most of the states have provided for definite improvement of a network of main highways, so that the next step in road development is the improvement of local road systems. The development of local road systems is being carried out successfully in many communities, and has been under way, in some cases, for several years as a result of early state road building.

Illinois State Aid Road Law

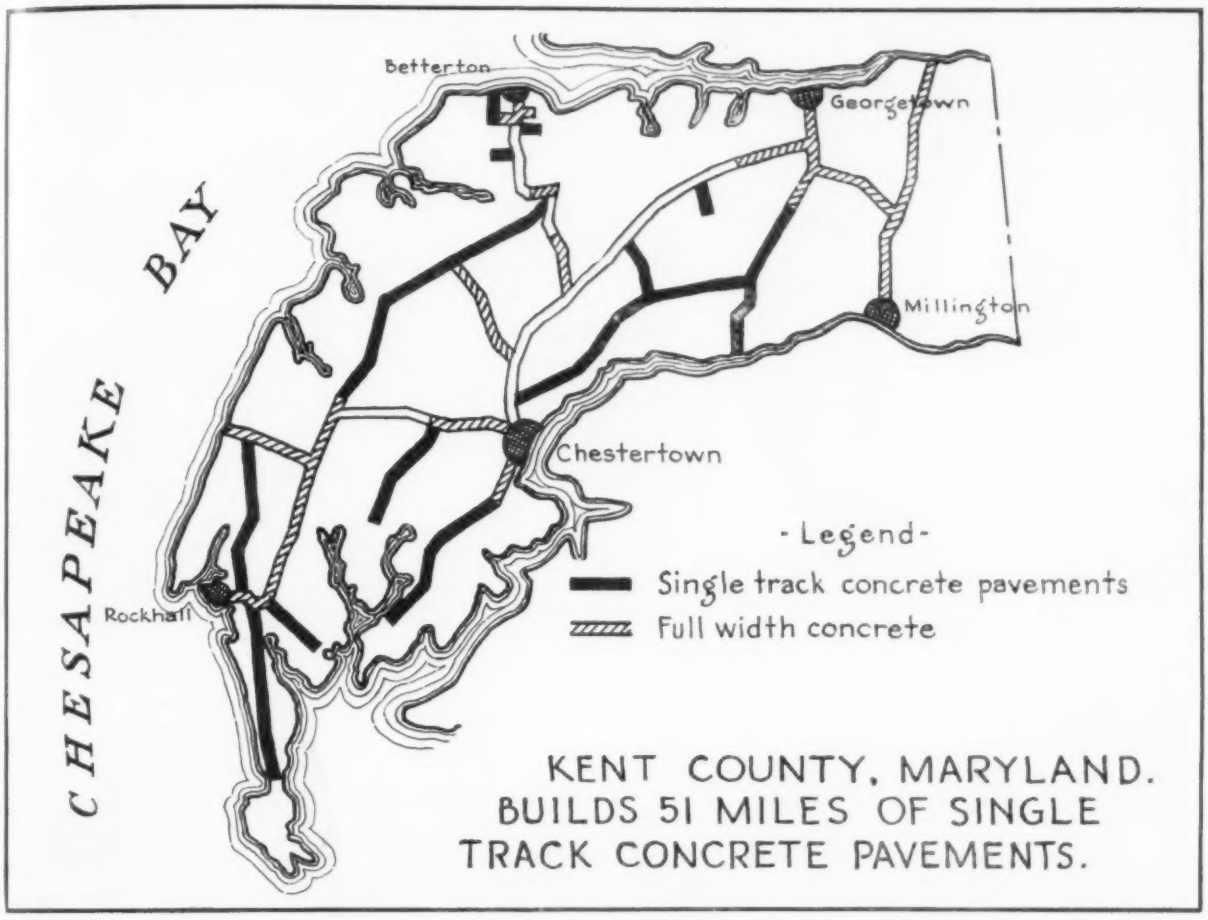
Illinois is noted among the road-building fraternity today because of the rapid strides that have been made during the last ten years in providing over 9,000 miles of high-type roads on the state system of highways. The state is known among students of highway laws as a pioneer in providing road-building help by establishing the principle that the larger road-building political unit should help the smaller road-building unit. The most widely known law in which this principle is used is the Federal Aid-Highway Law, passed in 1916. The same principle was adopted in Illinois in 1913 with the passage of the state aid road law, and the similarity between the wording and operation of the two road laws is striking.

The adoption of state aid to counties in Illinois in 1913 led to immediate road building. In 1914 Iroquis County took advantage of this law providing for a 50-50 division of costs between the state and the county, and built 6.7 miles of 10-foot concrete road. The success of this early improvement caused further interest in local road improvement, and although it received a temporary setback during the war, it continued actively afterward. The principle of the larger political unit helping the smaller unit in road building seemed so sound that, in 1919, the county extended it to the townships and agreed to meet any township road building on an equal basis. This resolution was immediately followed with "Rules and Regulations" for its operation that are very similar to the "Rules and Regulations" applying to Federal aid road-building.

Method of Financing County and Township Roads

In 1919 a total of eight townships passed road-bond issues for $428,000, and local road building began in earnest in 1921, when 16.7 miles of 10-foot concrete and 6.1 miles of 14-foot gravel roads were built. Several of these early bond issues were for five years and some for ten years. They have been paid off and new bond issues passed to meet local demand for roads, until some town-

SINGLE-TRACK ROADS IN IROQUOIS COUNTY, ILL.
1. Active construction on State Aid Route 8-C in 1931. 2. Danforth Road was paved in 1922. The grade lines conformed with the ground contour to reduce grading costs



ships have passed as many as three different road-bond issues. The road-bond issues approved in the county, including $135,000 approved in 1931, now total $1,556,000, with about $500,000 in bonds still outstanding.

In all cases, the county has met the township bond issue expenditures with an equal sum but without making any special county assessment for road building, although the state law provides for such a tax. The road-building money supplied by the county has been appropriated from general tax revenues, and usually from $50,000 to $60,000 has been appropriated yearly for this purpose. This sum has slowly decreased, however, until at present very little money is appropriated by the county for road building, since other sources of road revenues have developed.

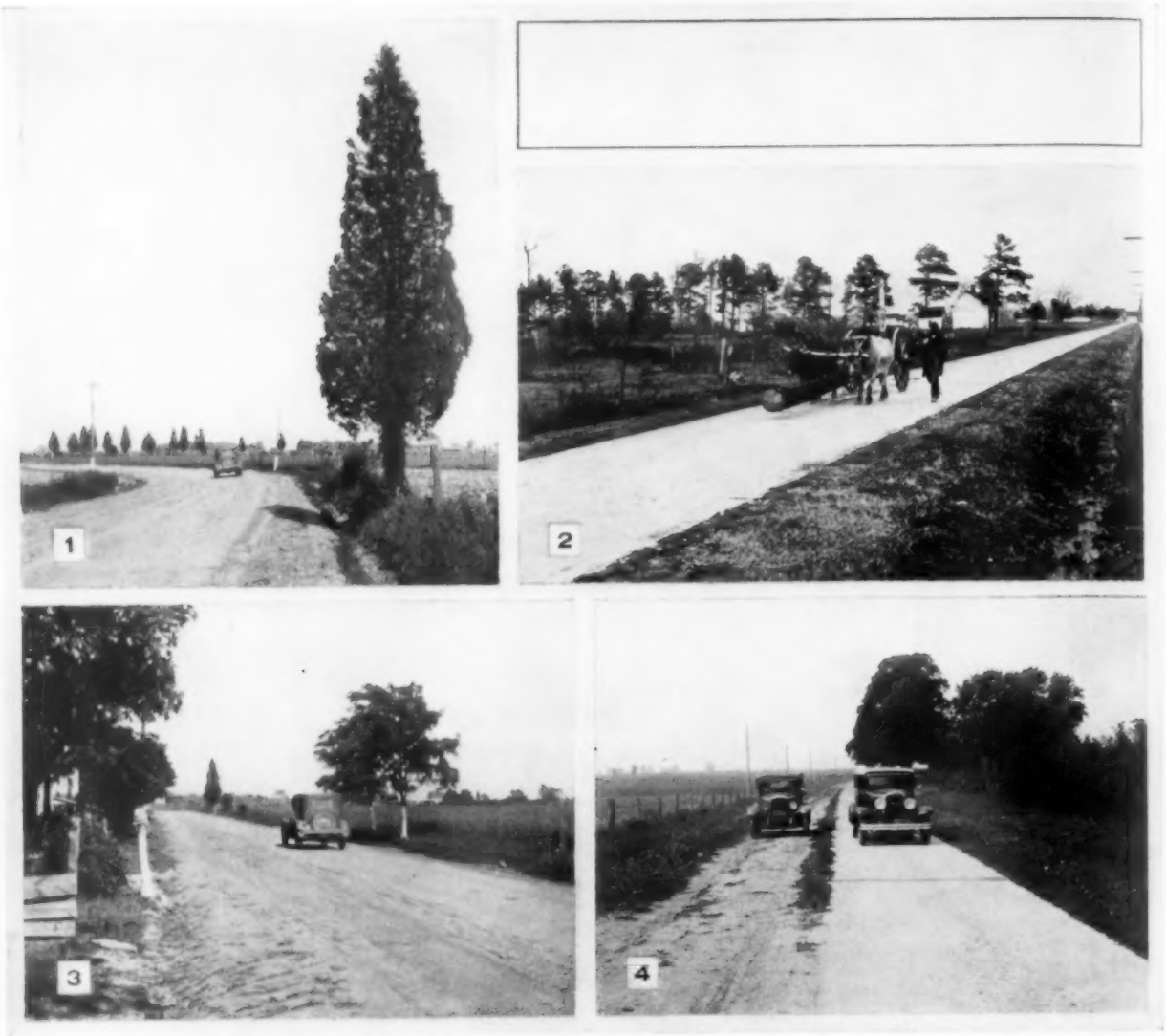
In Illinois, the state aid law provided that the state take over and maintain any hard-surface roads built by the county on the main county system of roads, and later, the state road bond issue laws provided that, in any case where a state bond issue road coincided with a county hard-surface road, the state take over the county road as a part of the state system, and reimburse the county for the original cost of the hard-surface road. Still later, when a 3-cent gasoline tax was adopted in Illinois, provision was made for refunds to the counties of one-third the gas tax, the refunds to be made in proportion to car registrations. These two points in the law have provided the county with sufficient funds to meet township road-building requests for the past few years.

Maintenance Costs

In all, Iroquois County has built 145.2 miles of 10-foot concrete roads, 3.1 miles of 16-foot concrete, 2.0 miles of 18-foot concrete, and 44.5 miles of gravel road, on its state aid system of roads. In the early years, 9.1 miles of bituminous macadam were built, but this later coincided with the state system of roads in the county and has been replaced with concrete; the county, however, received no refund for the road, because it did not come within the state aid law classification of a hard-surface road.

It is possible to determine from state records the average yearly maintenance cost of the 10-foot concrete roads. State Patrol Sections 31-65, 31-66, 51-63, 51-64, and 51-81, cover 89.8 miles of 10-foot concrete roads, in Iroquois and Champaign Counties. Champaign County borders Iroquois County, and has identical road conditions. The yearly average maintenance cost of the slab for this typical mileage was $40.37, and $63.48 for the earth roadway; a total of $103.85 for the traveled way. The average maintenance cost of earth roads in Iroquois County averages from $100 to $200 per mile per year, the larger amount being expended on the heavier traveled roads. It is evident that the improvement with 10-foot concrete would save the county about $100 per mile a year for maintenance, in case it was required to maintain them.

The maintenance of the gravel roads on the state aid system is paid for jointly by the state and the county.



TYPICAL SINGLE-TRACK CONCRETE ROADS IN MARYLAND AND DELAWARE COUNTIES

1. Part of the 50-mile single-track system built in Kent County, Md., 1929 and 1930. 2. Taylor's Island Road in Dorchester County, Md., built in 1919 to serve local traffic. 3. This Kent County, Md., road built in 1929 gives year-round road service to farmers. 4. There is no difficulty in passing on the wide shoulder on this Kent County, Del., road

Appropriations by the county, which are matched by the state, shows that the gravel roads have cost $167.87 per mile a year, over an 11-year period. The average cost per mile for the fiscal year 1930 was $209.80; for 1931 it was $225.04, and the appropriation for 1932 averages $257.06 per mile.

The satisfaction given by building single-track roads in this manner is shown by the fact that the system has been followed for several years and each year sees additional mileage improved. Bond issues totaling $135,000 were passed in 1931, and construction totaled about 17.5 miles of 10-foot concrete. The county has an additional 35 miles of 10-foot concrete on the program for immediate construction. The next five years will see the completion of a system of all-year roads on the main market system in the county. Practically all of this work has been under the supervision of the present County Highway Engineer, Benjamin Jordan, who has been the guiding spirit in getting Iroquois County out of the mud.

Experience in Kent County, Md.

In 1927 Kent County, Md., began to give serious thought to improving its local roads. In 1928 there were 68 miles of unpaved roads on the secondary road system of the county and about 80 miles on the tertiary system. The remaining 157 miles of roads in the county were used so seldom that improvement was not justified at that time. The soil in this county is largely sassafras loam, quite fertile, but almost impassable after rains and in the winter during periods of alternate freezing and thawing.

The moving spirit in local road improvement in Kent County was the Kent County Chamber of Commerce, which knew from experience that mud roads were a heavy burden on the community. The Chamber began to look around to find a way to improve the local roads. It happened that the State Road Commission built two 9-foot concrete roads in the county in 1927 as an experiment. These roads appealed to the Chamber of Commerce as good farmers' roads, so it was decided to use them as

secondary roads and to use slag roads for tertiary roads needing improvement.

State Aid Stretched Over Longer Distance

State aid to counties in Maryland is extended by building a certain mileage of 16-foot concrete road in each county each year. The Kent County allotment of 2.87 miles of 16-foot road could be stretched to 5.1 miles of 9-foot concrete. The state road laws indicated that the county could pass a bond issue for roads, obligate the county for their payment, also receive the proportionate cost of 5.1 miles of 9-foot concrete from the state to help pay off the bond issue, and the state would take over and maintain the concrete roads without further expense to the county.

After study of the laws of the state, it was found necessary to get legislative approval for a bond issue, as well as to submit it to a referendum in the county. Two bills were introduced in the Legislature authorizing a $1,000,000 bond issue for the 9-foot concrete and slag roads. These bills were passed by the Legislature, and later approved by the voters of the county, in May, 1929. Construction was started immediately and a network of about 100 miles of 9-foot roads was completed by the fall of 1930. The mileage of 9-foot concrete and slag was about equal, and the state maintains the 9-foot concrete roads for about $90 per mile per year.

The success of this program is best shown by the number of farms and the people in Kent County that have been reached by improved roads. There are about 970 farms in the county and over 470 of them, or almost 50 per cent, are on improved roads. The population of the county is 14,242, with 9,787 people living on farms. It is estimated that at least 9,200 of the county's entire population, or 65 per cent, now have improved roads for their use.

Division of Public Insurance Among Local Agents

By WILLIAM QUAID

BUYING insurance for a city is a subject that is little understood, but it does not become a problem when the facts to be considered are frankly faced. No one urges that the city buy a ton of coal from each dealer in town, and no one believes that anything else can be purchased on that plan. The local agents representing the insurance companies naturally urge that the insurance coverage be adequate and divided fairly.

It is not feasible to ask for bids such as are called for in construction work, because the law in most states requires all companies to charge the identically same rate. The funds of the city government are not placed with local banks on a competitive basis, nor would other financial transactions, with the exception of loans, be considered sound if the lowest bidder were selected regardless of other considerations. Insurance should be handled in a most businesslike way and at the same time provide all the services to which the policyholder is entitled in an effective insurance program.

Every community should have an insurance program worked out by responsible officials, who decide, after an analysis of property values, upon the extent of the insurance protection that is required. The problem is then narrowed down to obtaining a certain amount of insurance, the cost of which has already been established.

There are certain definite things to which the policyholder is entitled in an insurance service:

1. Inspections, surveys and reports of how improvements can be made and corresponding rate reductions obtained.
2. Insurance policies in strong companies approved by the state insurance department.
3. The service of local representatives, in making proper notification of loss to the various companies interested, advising the assured of the proper steps to take with respect to salvage or preventing additional loss, and in preparing necessary papers.

If the total amount of insurance is divided equally among all the agents in the town, it is quite likely the responsibility in connection with the services of insurance will also be so widely distributed that no one agent will consider himself responsible for undertaking the services expected of the agents as a group. Therefore, several communities have successfully divided the insurance so that one of the leading agencies is made responsible for concurrency of forms, inspection services, reports, and general insurance service. This office also acts as a clearing-house for all other agents. Forms are prepared and copies given to the agents writing policies, so that all policies will be alike and cover the same property. This agent will gather the policies together and forward them to the proper municipal official and he will assume the duty of paying each agent for the policy or policies provided. In case of loss the entire transaction will be handled through this office. The agency doing the bulk of the work should be rewarded by a larger share of the business.

In many of the larger towns and cities there is a strong local board or local insurance organization embracing in its membership the majority of the leading local agents and local insurance men ready to assume the problem of providing adequate insurance protection for municipal buildings. In this case the insurance on city property may easily become one of the responsibilities of the local organization, and when approached on the subject a committee will be appointed to handle the details and prorate the amount of insurance among the members, assuming responsibility for the efficiency of the service and the exactness of details.

The insurance on community property can never be fairly distributed or efficiently handled if it is considered a political football for officials. It must be handled exactly as a larger organization or a single property owner would handle a business. This can be done only if insurance carriers and insurance agents have the same degree of responsibility for the affairs of the community as they have for every other client on their books.

Carelessness in insurance matters on the part of public officials is actually carelessness with public funds. When buildings are erected with taxpayers' money, they belong to the public. The taxpayers should be protected against a possible second payment of the same amount of money in order to replace a building. Insurance on city property would be more carefully administered if the taxpayers made a determined effort to assure the protection of their interests at all times. The efficiency of such insurance protection can be safely entrusted to the local agents of the community if they are given to understand that they will be held responsible, not only for the insurance protection, but for all the details of insurance procedure.

Sanitation Furnishes a Holiday Resort

The Sanitary, Economic and Recreational Exploitation of Impounding Reservoirs in the Ruhr Valley

By **GORDON M. FAIR**

Associate Professor of Sanitary Engineering, The Harvard Engineering School, Cambridge, Mass.

LAKE HENGSTEY

The bathing beach is shown above. Below.—The pumped storage development on top of the hill in the background is 525 feet above lake level. The hydro-electric station has a capacity of 140,000 kw. of peak-load power

THE valley of the Ruhr River in northwestern Germany is one of the most densely populated regions in the world. Within its watershed, or adjacent to it, are nearly 3,500,000 people who draw their water supplies from the bottomlands of this stream. At the same time, the Ruhr is the natural drainage channel for a population of about 1,500,000, about two-thirds of whom are connected to sewage treatment works.

Sanitary control of the Ruhr River is vested in the Ruhrverband, an association representative of the municipalities, industries and water works of the valley. Organized in 1913, this association has since built seventy sewage treatment works, one hundred and twenty-five miles of sewers, fifteeen pumping stations and two impounding reservoirs, a third reservoir being under construction at the present time. To do this the Ruhrverband has spent about $16,000,000. Last year it collected from its members nearly $1,000,000 for the operation of its works and for capital and interest payment upon its bonds. An additional $500,000 of operating expense is met by earnings, largely from hydro-electric sources.

At the present time, the yield of the Ruhr valley for water-supply purposes is close to 500 m.g.d., about half of which is diverted for use in adjacent watersheds. The amount of water thus permanently lost from the river being greater than the normal low-water runoff, compensation is made by water discharged from storage in impounding reservoirs situated on the headwaters of the Ruhr and its tributaries. These upland reservoirs are managed by an allied asso-

Opportunities in America

While there are upon American rivers natural lakes that play a significant part in purifying the polluted waters of their feeders, and while we have constructed for water-supply purposes impounding reservoirs that also serve a recreational use, the Ruhrverband seems to be first to recognize that, under circumstances similar to those prevailing in the Ruhr Valley, a measure of "health, wealth and happiness" may be brought to a district by the creative imagination of its sanitary authority.

cation and must not be confused with the impounding reservoirs that are the subject of this article. It is to be noted, too, that the water supplies of the valleys are not drawn directly from the river but from wells and infiltration galleries which collect the underground flow of the valley bottom. The ground water stream, however, is fed largely by seepage from the river, supplemented, in many cases, by river water pumped to infiltration basins on the collecting areas. Thus the water drawn is purified by a system of natural filtration. It is generally chlorinated before consumption and is filtered through sand in some instances.

Reservoir Corrects Water Troubles

One of the important tributaries of the Ruhr is the Lenne, which joins the main river about 60 miles from its mouth in the Rhine. For many years, the water works below this junction had been troubled by the formation in the river of iron hydrate sludge due to the mixing of acid iron wastes, carried by the Lenne, with alkaline paper-mill wastes, carried by the Ruhr. In order to restrict sludge deposition to a river stretch above the water works, the Ruhrverband evolved, in 1922, a plan for the construction of an impounding reservoir below the junction of the two streams. As the plan progressed, however, other uses of this reservoir, or artificial lake, suggested themselves, until there were added to the original purpose of chemical and mechanical clarification of the river by precipitation and sedimentation of suspended matters: (1) increased self-purification; (2) utilization of available fall and other topographic features for generating hydro-electric power; and (3) development of recreational facilities for bathing and boating.

Further Developments

The investigations of the Ruhrverband engineers in connection with this first lake finally convinced them that the construction of impounding reservoirs presented the most attractive and economical solution of the sanitary needs of the valley. A broad plan was therefore devised in 1927 looking towards the construction of seven, later eight, impounding reservoirs in the 60-mile stretch above the mouth of the river. It is the novelty of this plan as an undertaking of a sanitary district, as well as its wider applications to power development and recreational uses, that has prompted the author to describe these works to American engineers and city officials.

The first impounding reservoir of the Ruhrverband, known as Lake Hengstey, was completed in 1928; the second, called Lake Harkort, went into operation early in 1931; the third, Lake Baldeney, is now under construction. The surface areas and capacities of these reservoirs, as well as those to be built later, are listed below:

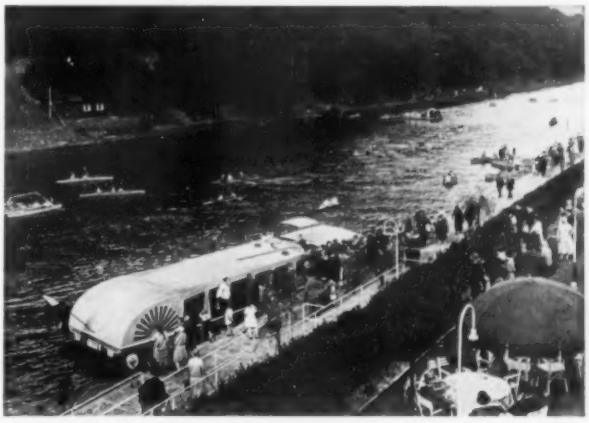
No.	Name	Surface Area Acres	Capacity Million Gallons
1	Hengstey	390	740
2	Harkort	350	870
3	Baldeney	590	2,370
4	Hohenstein	250	690
5	Herbede	300	920
6	Hattingen	370	920
7	Kettwig	100	320
8	Kahlenberg	470	920
	Total	2,820	7,750

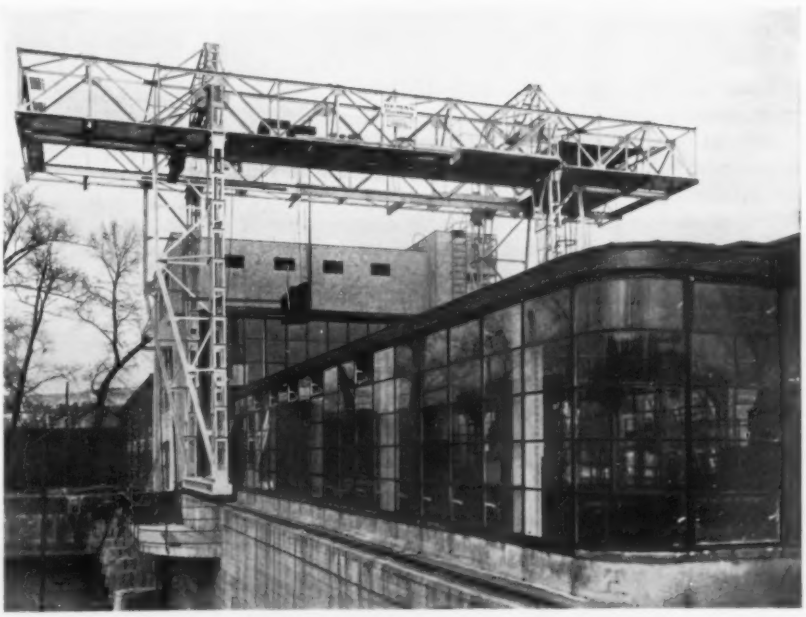
Lake Hengstey cost nearly $3,000,000 and Lake Harkort about $2,500,000. The revenue from their operation, however, is sufficient to carry all capital and interest charges upon them; so that the purification of the Ruhr River accomplished by them costs the member organizations of the Ruhrverband nothing.

The impounding reservoirs of the Ruhrverband present three notable features—sanitary, economic and recreational.

Sanitary Features

Someone has compared a sewage treatment plant to a river that is wound up to cover a limited area, for the





THE ISLAND RESTAURANT on Lake Hengstey is shown above

THE POWER HOUSE at the Lake Harkort development, below. Note the traveling crane straddling the building, also the architectural features typical of modern designs of the Ruhrverband

forces of purification employed in sewage treatment are closely akin to those operative in a natural stream; but they are artificially intensified. Much the same could be said in comparing a running stream with an impounding reservoir, intensified purification in the reservoir resulting chiefly from reduced velocity, increased time of flow and expanded water surfaces. With velocity reduced during longer times of flow, the waters are clarified mechanically by sedimentation and chemically by precipitation. Increased time of flow and enlarged water surfaces stimulate biological and biochemical activity; plankton develop and remove substances from solution; reaeration, i. e., absorption of oxygen from the air, is increased by greater exposure of water to the atmosphere; sunlight, the universal germicide, penetrates into the clarified water to greater depths and over wider areas.

One thing is essential for the satisfactory operation of these natural sewage treatment works: removal from all wastes discharged into the tributary streams of the grosser suspended solids that would form sludge banks of appreciable size in the reservoirs. Not only would these deposits cause silting of the reservoirs, but they would also decompose, mainly during the summer months, at a rate that might exceed the self-purifying capacity of the waters. Within limits, sludge deposits produced by pre-settled wastes, however, are scoured out by spring freshets and carried down stream at a time when high dilutions make their presence in the water of minor significance.

The old adage that "running water purifies itself" is correct only if expanded to include the words "provided it is given sufficient time to do so." The impounding reservoirs of the Ruhr strengthen the element of time. Their quiescence, on the other hand, reduces the rate of reaeration, which is higher in "running water than in standing water." The total amount of air absorbed, however, is increased, a slow rate of reaeration being more than offset by providing larger surfaces of water through which oxygen absorption can take place for a longer time. The combined surface area of all the lakes will be 4.4 square miles, and it is estimated that the time of flow of the river will be raised, in a 47-mile stretch, from 18 to 84 days. It is expected that the oxygen content of the stream will be maintained close to its saturation value, whereas it dropped to about 40 per cent saturation during the dry summer of 1929.

These sanitary characteristics of the impounding reservoirs make it possible to dispense with the finishing or biological processes of sewage treatment works, such as filters or activated-sludge units. These are replaced by the biochemical activity of the artificial lakes. Sedimentation of sewage prior to disposal by dilution, however, is essential to the success of the reservoirs. It is interesting to note that the Ruhrverband has the courage of its convictions and is no longer constructing biological treatment works, while continuing to develop its program of clarifying all water-carried wastes by sedimentation.

So far as the water works of the valley are concerned, it is expected that the pollutional load upon them will be greatly reduced and that odors and tastes, especially those due to phenolic wastes, will be practically eliminated. At the same time, the reservoirs will add 7.75 billion gallons of storage, two-thirds of which could possibly be utilized for water-supply purposes during periods of extreme drought. In contrast to the storage reservoirs on the headwaters of the Ruhr, which require many months to be filled, the reservoirs in the valley could fill rapidly, because the entire flow of the Ruhr passes through them.

Water-Power Features

The reservoir plan of the Ruhrverband was made economically feasible by including in it the development of unexploited water powers. These are more favorable in the undeveloped upper valley than in the lower reaches of the river where there are many small water-power dams. The latter are capable only of being raised or grouped together for more economic generation of power. The two completed reservoirs include four hydro-electric plants, one of which is a pumped-storage development, to be discussed later. The three plants operate under the low heads, 10 to 23 feet, created by the impounding dams. They have an average annual output of 52,000,000 kilowatt-hours and were constructed at a cost of $1,200,000, or $160 per kilowatt capacity. The cost of the two power houses in connection with the second reservoir was reduced by designing the traveling crane so that it straddles the building and operates through lifts in the roof.

The pumped-storage plant on Lake Hengstey draws almost 400,000,000 gallons of water from the reservoir and lifts them through 525 feet into a cut-and-fill reservoir built upon the heights overlooking the lake. There are four penstocks, each 10 feet in diameter. Water is pumped by electric power during 14 night hours, and is drawn, during 6 to 10 day hours, to drive the water wheels and generators. The rate of pumping is about 800 cubic feet per second; the rate of draft about 2,000 cubic feet per second. In this way 170,000 kilowatts of cheap night power are converted into 140,000 kilowatts of valuable peak-load power; the yearly output is 150,000,000 kilowatt-hours. Similar plants are projected for three of the other reservoirs. As previously stated, the income from the sale of electricity or lease of the power plants is sufficient to carry all the charges, both capital and interest, upon the reservoirs.

Recreational Features

As shown in three of the illustrations, Lake Hengstey has become a recreational center for the industrial population of the valley. An association, of which the Ruhrverband is a member organization, was established to develop the recreational opportunities afforded by the reservoirs and has spent about $250,000 in doing so. There are two large bathing beaches on Lake Hengstey. Both of these are provided with restaurants; a third restaurant is situated on an island which can be reached by bridge or boat. On a Sunday or holiday the lake swarms with canoes, rowboats and sailboats, and the bathing beaches are crowded with men, women and children basking in the sunlight, while older folks prefer the comfort of shaded armchairs in one of the restaurants. There are lookout points upon the wooded heights to the north of the reservoir and well-kept paths lead to them or wind along the shore of the lake. Competitive sports are encouraged, and regattas are held from time to time.

Acknowledgment

The author is greatly indebted to Dr. Karl Imhoff, Chief Engineer of the Ruhrverband, for conducting him over these reservoirs and for furnishing him the facts and illustrations that underly or accompany this article.

Planning Regional Cooperation in Police Work

IN the six counties of which Cincinnati, Ohio, is the metropolitan nucleus, there are 147 police agencies, independent of each other but all overlapping in some degree. They include the police officers of the 6 counties—4 in Ohio and 2 in Kentucky—and their 51 townships and 13 magisterial districts, with 12 cities and 65 villages superimposed. Their police establishments range from a part-time marshal or constable to the Cincinnati force of 655 men.

In order to point a way for the improvement of police service among these many units, the Cincinnati Regional Crime Committee sponsored a study by Bruce Smith, police expert of the Institute of Public Administration, New York City.

In the foreword to Mr. Smith's report, recently published by the Institute, Dr. Luther Gulick, Director of the latter, says:

"'*The Regional Police Plan for Cincinnati and Its Environs*' is a pioneer work. It is the first specific study of policing as both a local and a regional problem; and for the first time there is laid out a cooperative regional police organization which in this case even crosses a state line. It is notable also that the plan here suggested has been accepted by the police administrators concerned and that the individual reforms and adjustments which it contemplates are already in course of introduction."

In discussing the approach to a cooperative program for the region, Mr. Smith says:

"It is clear that any attempt to coordinate so many diverse police units will prove to be no mean task. While such coordination may prove difficult and will in some respects doubtless fall short of modern police requirements, there are several elements in the situation which will be conducive to the acceptance of a comprehensive plan for police coordination. Although these 147 police agencies are independent of each other in a political sense, they may readily be made interdependent in matters of routine police work. Thus, the city of Cincinnati with its more extensive police facilities can profit substantially from any scheme which will make police information and general intelligence concerning crime throughout the entire area quickly available to its own police force. It can profit also from any means of quick communication which may be set up whereby reports of offenses can be relayed to the most remote portions of the region. Of special significance will be the control over means of egress which can be secured if the various radial highways and railways are placed under direct observation in emergencies.

"On the other hand, the smaller communities can profit through coordination of their protective and investigating work with that of the Cincinnati Police Department. The latter can render services in training, in criminal identification, in the operation of *modus operandi* systems, and as a communication center, which are now utterly lacking in nearly all of the other police agencies, and which the smaller police forces, acting either alone or collectively, could never hope to provide for themselves."

The development of the existing agencies, the need of cooperation, and possible remedies for the present patchwork pattern of police forces, are described in part as follows:

Joint Action Across County and State Lines—or Greater Unification of Police Operations?

"The police protection provided by rural communities was established in a time when the most commonplace of modern facilities were not available. The early English sheriff and parish constable still find their counterparts in our small communities today, even though these institutions have long since undergone extensive changes or have been abandoned altogether in the land of their origin. England tried for nearly a thousand years to fashion them into reliable and effective police instruments and then desisted; but America is still trying.

"Much the same situation exists with respect to the police forces of our smaller cities. Their numerical strength is so slight that highly organized methods of protection for them can never be developed on an independent basis. So long as existing patterns are employed, they must frequently combat our complex urban conditions with limited resources of men and equipment.

Overlapping Police Jurisdictions

"No extensive treatment of this situation is necessary. The conditions are well-nigh universal throughout the country, and they are now generally coming to be recognized for what they are. In fact, the last twenty years have been marked by a perceptible swing towards the more effective policing of small communities. Uniformed county patrols have appeared in some jurisdictions, state police in others. While such as these constitute a highly favorable departure in most instances, and are significant because of the recognition of the new conditions which they involve, there is no avoiding the fact that they have complicated the problem to some extent. For each new police agency which is created with an enlarged territorial jurisdiction has thus far been superimposed upon existing police forces. Such a program can only end in confusion.

"It is quite possible that the system of overlapping police jurisdictions satisfied the requirements of the time in which it was created. Even today there may be places where the plan works with a reasonable degree of satisfaction. Yet the advent of the railroad, the automobile, the motor-bus, and the improved highway, has produced in many communities an entirely new set of conditions which cannot be met except with the aid of the most careful adaptation and planning.

New Problems in Attacking Crime

"These modern means of transportation have virtually destroyed some of the spatial factors upon which our local police forces were originally predicated. In some instances the new facilities for transportation have virtually brought urban conditions to the open countryside. In the regions immediately surrounding great cities, the progressive multiplication of police forces has not been followed by an increase in police effectiveness. All metropolitan areas and many rural districts have thus found themselves quite unprepared to contend with the new problems of crime repression which have grown with the passing years.

"Any radical approach to the questions thus presented might easily involve a complete dismantling of existing police facilities and substitution of a single police unit for the protection of a unified area. Yet this method of approach would almost certainly prove barren of early constructive result. The time has not yet arrived when local governments will voluntarily surrender the power and the duty of police protection delegated to them by the state; and the growing disposition of state governments to intervene is not yet sufficiently supported by a condition of overruling necessity. . . .

Curing a Patchwork System

"Crime from its very nature knows no political boundaries. The offender travels hither and yon throughout the region in the same fashion as the law-abiding population. In the natural course of events a certain number of offenses are committed at some distance from the offender's domicile. New means of transportation have greatly simplified escape from the jurisdiction where the crime was committed. Under these circumstances a common program of crime repression and certain common facilities represent a clearly indicated need.

"Unfortunately, the scheme of police organization in force in rural areas is usually quite inadequate to meet modern requirements. The several counties can, if they will, minimize the effects of this condition by establishing extensive rural patrols and bodies of criminal investigators, together with other practical means of coordinated action. If this work is well and thoroughly performed, the absurd patchwork of county, township, village and city police forces will be rendered more effective during the years which must elapse before the whole medieval pattern is swept away, and a more rational system is substituted.

"The signs which point to this as an eventual development become increasingly clear. In Iowa and Illinois, a state-wide system of rural vigilantes is organized, thus signalizing the collapse of the sheriff-constable régime as a device for protection. In many other states there arises a movement, now rapidly gaining headway, to merge the smaller counties and towns so that a sufficient basis may be laid for governmental action along a wider front. Regional planning programs have appeared in most, if not all, of our metropolitan areas. State police forces are an accomplished fact. Everywhere we find a growing recognition of the need for larger governmental units, in order that more adequate public services may be organized.

"The regional police question is but a part of this larger problem; yet a highly important part. Perhaps in no field of government is there greater need for expansion of territorial jurisdiction, and an increased personnel to serve it. Mastery of new and exacting police techniques, acquisition of new and expensive police equipment, alike lie beyond either the present or the future capacity of small rural communities, so long as they act alone and independently. If, through a plan of common action, some of these rural areas are able to demonstrate their ability to meet the new conditions, they may be able to preserve their local police autonomy. For those which do not or cannot meet this test, the only recourse will be the absorption of local police activities by the counties, by regional groups of counties, or by the state."

Japanese Gardens Replace Open Sewer

By C. M. BRESNAHAN

FOR over forty years, the "Junk Ditch" was notorious in the annals of Fort Wayne, Ind., and every administration taking over the reins of government was harangued, both verbally and by the press, because there seemed no way in which to rid the city of the filthy ditch which carried the refuse from two large meat-packing plants, as well as the sewage of a community not blessed with adequate sewage disposal. Today, this foul-smelling open sewer has been transformed into a beauty-spot.

Three years ago, the administration asked the Department of Parks to do away with this nuisance. Today, the result of the work stands as a monument to the Department, its Superintendent, Adolph Jaenicke, and the city as a whole. The area is known as Swinney Park, and divides East Swinney Park, a natural reserve, from West Swinney Park, which is an amusement center.

Soundings were made of the ditch and it was found that five feet of accumulated muck or sludge would have to be removed before the work of beautification and the sanitary operations could be started. Scores of men were put at work and the required depth was excavated. Pipes were put in to take care of the sewage so that there would be no further accumulation of sludge. Tons of stones were hauled to the site, and the now famous Japanese gardens were begun. The entire site had been waste land prior to this time, so that virgin soil was available for the work.

AN ATTRACTIVE PARK WHERE ONCE THE STENCH OF AN OPEN SEWER MADE THE SITE OBJECTIONABLE

START OF THE WORK IN CLEANING THE STREAM BED AND MAKING A SECTION OF THE ROCK GARDEN

CONSTRUCTION OF A POND AND ROCK GARDEN UNDER WAY

With a replica of Fujiyama, the sacred mountain of Japan, the idea of an old Japanese scene is carried out in minute detail. Fountains play on the upper sections of the gardens, the waters running in rapids down the hillside, under a rustic stone bridge, and into basins at the bottom, where lotus and water lilies grow in the shades of Japanese cherry and native weeping-willow trees. Perennial vines and shrubs dot the rocky sides of the gardens, and flag walks lead to points where the visitor may view the gardens from the various pagodas hung with lanterns, or from platforms conveniently placed about the various terraced stretches of the development.

The work is still being continued according to previously developed plans. Swinney Park is one of several noteworthy developments of the Fort Wayne Park Department. Among other projects are the Grotto of Capri, duplicated on a small scale in Memorial Park, and the sunken gardens in Lakeside Park, replicas of the famous royal gardens of Berlin.

For the remarkable illustrations of construction and completed work, acknowledgment is made to the Alpha Portland Cement Co., whose product was used for much of the undertaking.

ONE OF THE LAGOONS AND A WELL-LANDSCAPED VISTA

Children's Nutrition in the Present Emergency

THE nutrition of children threatens to become an exceedingly serious problem in the country. As an aid to local welfare and relief work, the very best of available thought on this subject in the present emergency is expressed in two 4-page leaflets sent out by the American Child Health Association, 450 Seventh Avenue, New York City. These are: "Emergency Nutrition,"' by Dr. Henry C. Sherman, of Columbia University, and "Food at Low Cost," by Lucy H. Gillett, Superintendent of Nutrition Bureau, Association for Improving the Condition of the Poor, and member, Nutrition Committee, American Child Health Association.

Dr. Sherman emphasizes this guiding principle: "To provide these nutritional essentials of which a shortage tends to permanent injury, and to do this (while necessary) even at the cost of a sacrifice of other features of the dietary which are normally desirable but not absolutely essential." During the acute emergency, diversifying the diet merely for the sake of variety need not be considered. The absolute nutritional needs are to be met by milk in some form and some fruit or vegetable to provide the essential mineral elements and vitamins, and enough breadstuff to prevent actual weakness from hunger.

Miss Gillette gives five groups of food, some of which children need every day "to grow best"; also a statement under the heading, "When *Every* Cent Must Be *Well* Spent, *First* Buy:" followed by "Thrift Suggestions"; also a "Weekly Grocery Order for a Family of Three or Four." These statements are intensely practical. The cost, including delivery, of Miss Gillette's leaflet is as follows: 10-25 copies, 1c each; 25-99 copies, ¾c each; 100-499 copies, 3/5c each; and 500 or more copies, ½c each. Apply to the Association at the address given.

Modern Parkway and Neighborhood Unit Design in Large Manchester Development

By **BARRY PARKER**

Fellow, Royal Institute of British Architects;
Past President, Town Planning Institute,
Letchworth, England

EVERY advance in town planning is from personal gain at the expense of communities towards personal gain as members of communities.

We do not quite appreciate the extent to which during recent years we have promoted our interests as members of communities as an alternative to promoting our interests as individuals. Two advances, however, which are coming too gradually and too slightly, are improved methods of acquiring land by public bodies, and the retention by the community of the added land values which public improvements create. The process will have to go on until these facilities have been enormously increased. The time must come when every community may purchase compulsorily, at its market value, not only all the land onto which it is likely to spread, but also land to be left open for a green belt round it, and also land beyond this green belt on which to establish satellites.

We sometimes fail to realize that when a man dies leaving £200,000 to his successors, which has come to him because a community has spread onto land he possessed, that community has to pay interest on that £200,000 to his successors in perpetuity, and this interest is a first charge on every undertaking of all members of that community and no benefit whatever is received in return. There is no community in this country which is not annually paying away large sums in this way.

We act today in an incomprehensibly foolish manner. We construct new roads and tubes at the public expense, and create land values which would have far more than paid for these roads, and we make presents of these values to the owners of the land through which these roads pass.

Manchester has been wiser; it had to spread out into Cheshire. It might have bridged the Mersey and laid roads which would have enhanced land values on privately owned land. But Manchester was wise enough to first purchase most of that land and so create values for itself. To conserve and stabilize these land values, it prepared a plan zoning the area affected and determining which parts of it shall remain rural, and where industries, and shops, and all other components of a town, shall be. And it is this plan for the development of Wythenshawe Estate in Manchester, providing for a new community of over 100,000 inhabitants that I am asked to describe.

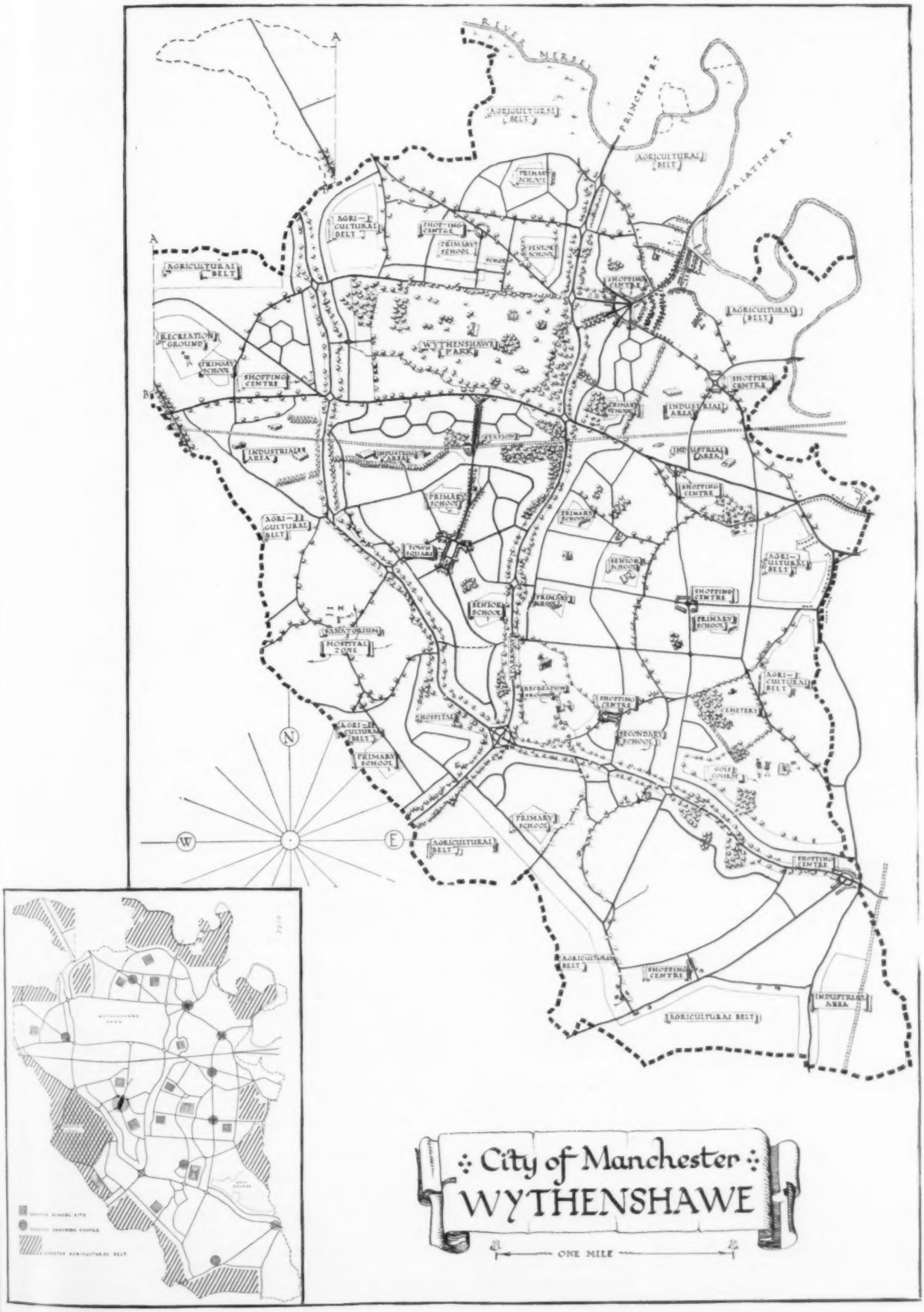
What the Road of the Future Must Be

In order to understand it, we must first attempt to visualize what the road of the future must be. I will call this road a parkway. Now, some people seem to think that the main characteristic of such a road is that it should lie in a strip of park and should give its users the feeling that they are passing through a park. Really this characteristic of a parkway results from the consideration of the many practical requirements which a road must fulfill, and not from the desire to create esthetic qualities. What these requirements are I will endeavor to show.

Since the war we have spent enormous sums of public money on the creation of roads. On the frontages of these roads we have allowed people to erect buildings approached from them, with the result that each four-track road has come to have only the efficiency of a two-track road and each three-track road has come to have only the efficiency of a one-track road, because two tracks on each are occupied by stopping and standing vehicles in front of the buildings. Moreover, by allowing buildings on the frontages of these roads to be approached from them, we have rendered them dangerous through vehicles coming out onto them from those buildings and turning out of them into approaches to those buildings. So the two-track main road of the future must have the efficiency of the four-track road of today, created by the absence from it of all standing, stopping and turning vehicles. Then the money which has hitherto been spent on the two additional tracks in the main road can be spent on subsidiary roads provided to afford access to the buildings which face the main road, and the efficiency of the main road will be still further enormously enhanced by the greatly increased speed at which traffic can move on it, and move in safety. On it a motorist must be able to travel swiftly, knowing no vehicle will come out of, or turn into, abutting roads or buildings, and that there are road junctions and crossings only at very infrequent intervals, and that these will be clearly indicated to him, and, moreover, he must know that he will be compelled by the forms given to these crossings to slacken speed on approaching them.

We now realize that the way to make road crossings safe is to so plan them that there is no crossing of routes of vehicles at them. We now arrange that instead of crossing one another, vehicles shall everywhere first join the stream of other vehicles which is moving in the same direction as they are moving and then turn out of that stream into the road they wish to take. This principle (which Fritz Malcher in his articles in THE AMERICAN CITY has designated the "steady-flow" system) is being accepted everywhere, with it being coupled the principle that all vehicles must be compelled, by the form given to every important road crossing, to take it more slowly than they may legitimately travel elsewhere than at a crossing. Where two roads of equal traffic importance cross, drivers on each road must be compelled to slow down equally. At the crossing of a road of major traffic importance by a road of less traffic importance, the driver of a vehicle on the less important road should be delayed somewhat more than is the driver of a vehicle on the more important road. Where a road of quite minor traffic importance crosses a road of major traffic importance, the driver of a vehicle on the minor road should be subjected to a quite considerably greater delay than is the driver on the major road.

All this is accomplished by placing in road crossings, islands, of shapes varied to meet the differing conditions as to traffic importance of roads, as to angles at which roads intersect, as to topography, and as to everything else, and is accomplished by also placing subsidiary islands around these center islands. These subsidiary islands divide the traffic into one-way streams before it reaches the center island. They are absolutely essential to success, and on or near each of them a "Keep left" [in America "Keep right"] sign must


RIVER MERSEY
PRINCESS RD
PALATINE RD
AGRICULTURAL BELT
AGRI-CULTURAL BELT
PRIMARY SCHOOL
SHOPPING CENTRE
SENIOR SCHOOL
WYTHENSHAWE PARK
RECREATION GROUND
INDUSTRIAL AREA
STATION
TOWN SQUARE
SANATORIUM
HOSPITAL ZONE
HOSPITAL
CEMETERY
SECONDARY SCHOOL
GOLF COURSE
N
W
E
City of Manchester
WYTHENSHAWE
ONE MILE

be placed. It is, before all else, vital that the center islands in these crossings should be amply large enough to fulfill their purpose, and also that the subsidiary islands should be long enough to fulfill theirs. If the center islands are too small, the traffic flowing round them is not formed into a stream which is sufficiently long to allow traffic which is joining it to join it tangentially. In other words, the traffic converging on the circulating traffic will converge on it too nearly at right angles. Also, the routes vehicles have to take come to be too sharply curved.

An Error to Be Avoided

It has already become clear that we have islands at Wythenshawe which are considerably smaller than they should be, but possibly not too small to function tolerably well. I only hope that their being too small will not be prejudicial to road crossings of the type of which they are component parts, and that defects arising from the smallness of these islands will not be attributed to the system of planning road crossings to which they belong. A fact of peculiar interest is that the slowing-down of traffic at crossings in a road does not entail any loss of efficiency in that road, but the same number of vehicles will pass over a crossing in an hour as would have passed over it if not slowed down at it, whereas the loss of efficiency in a road caused by stopping the traffic on it, to allow traffic to cross it, is great. The great difference between the form of road crossing we are considering and any other form of road crossing is that the flow of vehicles over it is continuous and uninterrupted in every direction, and at all times. No vehicle has ever to stop and restart, and it removes the necessity for police control. When we consider the enormous cost of police control of road crossings in the rest of the city of Manchester, the saving effected by the introduction of crossings of the proposed type in Wythenshawe Ward will be appreciated.

I began what I had to say about parkways by pointing out that they are not primarily proposed because of their beauty but are principally put forward as solutions of practical problems. Being freed from standing, stopping, and turning vehicles, and from dangers created by vehicles coming out onto them, they become speedways, allowing motors to get in and out of towns rapidly. So the traffic on the carriageways in them will move very rapidly.

Importance of "Parked" Strips

This being so, footpaths must be far removed from these carriageways. Pedestrians could not use footpaths placed close alongside these carriageways for fast-moving motor traffic. Nor is the safety of the fast-moving traffic, or the speed which it is desirable that traffic should attain, possible under liability to have pedestrians suddenly stepping out onto the carriageway from a pathway. A further requirement for safety and speed is the long "sightlines" and the wide unobstructed views afforded to motorists by the "parked" strips on each side of the carriageway. So come into existence the wide, planted and grassed strips in these parkways which make them so attractive and beautiful.

But there is another reason for the parked strips. No one wishes to live on our highroads in their present crowded, noisy, smelly, and dusty condition. So where they pass through purely residential districts, land values remain about stationary, though great increases of land values are created where new highways pass through districts which are not purely residential. But sites for houses on parkways are rendered desirable by their commanding, in perpetuity, an open outlook over the green tree-bedecked parkways and by their being far removed from the carriageways in those parkways. Therefore, such sites are very valuable. They are valuable also because they are on speedways by which occupants of houses on these sites can rapidly get into town and home again. After all, the distance one lives out of town is not what counts; what matters is the time it takes for one to get in and out. Parks are a great blessing to the communities they serve, but enjoyment of them is almost confined to the occasions on which visits to them are deliberately made. Parkways, on the other hand, make the delay and the ordinary routine journeys pleasant. Moreover, a park may afford delightful outlooks for houses which overlook it, but it does this by their occupying one frontage to the road and thus considerably increasing the cost of development. The alternative is for this park to be behind houses built on its frontages to the roads which skirt it. Then it ceases to give pleasure except to those who have the time and inclination to visit it, and to those who occupy some rooms in the houses built on that side of the road which is nearest to the park. Both frontages to roads in parkways are occupied by houses, without any sacrifice of public enjoyment. Houses facing parkways directly overlook the park land in those parkways with no roadway intervening between them and it. So again it has been proved that that which is best practically is best esthetically, and parkways evolved to meet traffic, and other needs, meet these needs artistically.

When we come to consider the town plan for the Wythenshawe Ward I may be asked where are the ring, circumferential or orbital roads which are to be found in other town plans. Such roads are reasonably effective, as compromises, meeting the traffic requirements of existing towns, so closely built up as to preclude the possibility of introducing anything more effective. A plan for a new town should provide that every one may reach any part of that town by the rapid transit roads. It should not postulate that people will reach a ring road by rapid transit roads, and then, from it, filter through to more central parts of the town. As to the provision in the Wythenshawe Ward of a section of a ring road round the center of the city, a glance at the plan will show that the parkways do this satisfactorily when it is remembered that most of the Wythenshawe Ward should be included within such a ring road.

Planning "Neighborhood Units"

Of late years much study of "neighborhood units" has been made. In connection with these the chief question has been whether not only schools and institutes, and in some cases religious buildings, but shops may be in the middle of a neighborhood unit. That schools should be, has never been doubted. Neighborhood units are bounded by traffic routes, and children going to and from school should not have to cross traffic routes. Recently, town plans have been so made that no child shall have to cross a carriageway on his or her way to or from school, and at least one plan in which this provision is made is being executed. Shopkeepers favor sites at road crossings. But sites for shops at road crossings are disadvantageous to traffic because vehicles draw up and stand in front of shops and create dangers and complications. On the other hand, even if the desirable size for a neighborhood unit is one which contains a population large enough to support, say, a small grocery-store keeper, a barber, or a baker, it certainly is not large enough to support a draper, a music shop proprietor, a chemist, a hatter, an outfitter, or a tailor. So, rightly or wrongly, the decision was come to that subsidiary shopping centers should be at road crossings, but at those of secondary importance, and that the shops in them should be set back from the roads and should have their own provision for parking cars off the highways. When this is done, each shop may draw its customers from four neighborhood units. The distinguished Canadian town planner, Noulan Cauchon, has pointed out the reduction in lengths of road needed to afford access to a given number of building sites, which results from the adoption of the hexagon, in substitution for the rectangle, as a basis of a

plan. This reduction is something like 10 per cent. The great savings effected by taking advantage of it are obvious. But hexagonal development has many other advantages over rectangular development. One of these is the substitution of obtuse road junctions for rectangular road junctions, and, therefore, the substitution of an angle around which a motorist can see a long way for one around which he cannot see so far.

The Wythenshawe Ward Plan

Now, the interest attaching to the accompanying town plan for the Wythenshawe Ward is chiefly in the application to it of all that I have been saying. It demonstrates how very much greater are the advantages which the ownership of the land, to which it relates, gives to the community than are any advantages the community may gain by merely promoting a statutory town plan for that land.

PROGRESS PHOTOGRAPH OF THE WYTHENSHAWE DEVELOPMENT

After all, what a community can do under a statutory town plan is largely of a negative character. It may prohibit the doing of things by one landowner which are clearly disadvantageous to another. Its powers actually to promote are but limited compared with those of the owner of the land. Sir Ebenezer Howard put this very well when he said: "A local authority has only such powers as have been specifically given it by statute. A ground landlord has all the powers which have not been specially taken away from him by statute." Under a statutory town plan a local authority may protect a man against his neighbor's obviously depreciating the value of his property, but that local authority's protection will be exercised more completely when it is over land it owns, and it will extend to the whole of that land. Zoning tends to stabilize the values of land, and to minimize the risk of their falling through the misuse of adjoining land, but it does not hinder any enhancement of its value. When a community owns land, increases in its value come to that community; therefore it develops its land in the way it thinks best calculated to increase its value. Nothing more surely does this than does an ample and generous provision of open spaces. No enhancement of land values is lost when open spaces are so provided. All increases in land values are merely transferred to the rest of the land. They are not lost. Therefore the owners may devote ample land to the provision of open spaces with the knowledge that their maximum loss is strictly limited to what the land so devoted actually cost them, and that this maximum will probably not be reached.

The town plan for the Wythenshawe Ward shows what parkways are, and how the opportunity has been taken to enhance them by carrying them close to existing woods, such as those in, or near, Baguley Bottom, and to bring open spaces, school playing-fields, recreation grounds, hospital reservations, and Wythenshawe Park onto parkways. It will be seen how this plan is made up of "neighborhood units," each with its shopping centers; these centers averaging about three-quarters of a mile apart, so that no one will have to go more than half that distance in order to shop. It will be seen how far this plan shows success in taking advantage of the gains and economies offered by hexagonal planning, how far it has been practicable to secure that children shall not have to cross traffic routes on their way to and from school, and how far it has been possible to provide that the town shall be surrounded by an agricultural belt. No attempt has been made to give details of zoning in the plans I show. These details are too intricate, ranging from one house to fifteen acres in the agricultural belt to twelve houses to the acre in other parts, and providing for everything that will be needed in such a town. But the plans do show the industrial areas, and I should say it is intended not to permit in them the establishment of smoke, fumes, smell, or dust-producing industries.

For clearness' sake I have omitted the detailed planning from most of the map, showing only a few sections typical of the whole, and illustrative of characteristic detail.

Operation of the Equipment Fund of the City of Minneapolis

By F. WALTER HOLTMAN
Chief Accountant, City Comptroller's Office
and
CHARLES J. BERRY
Accountant, City Engineer's Office

A CRANE AND CLAMSHELL USED BY THE SEWER DEPARTMENT

AN amendment to the city charter was adopted by the city of Minneapolis, in 1929, consolidating all street work under the City Engineer; the work to be financed from a single fund known as the Street Fund. Prior to this time, each of thirteen wards had operated the street work in its own ward, for which a separate tax levy provided funds. Each ward purchased, operated, and maintained the equipment necessary to maintain its streets, to provide for snow removal, and to do allied work.

Aside from this street maintenance work, all new construction work in the city of Minneapolis is done by day-labor. This necessitated that the Sewer Department, the Paving Department, and the Bridge Department, should each operate and maintain its own equipment.

An Equipment Department Created

The consolidation of the street work, under direct control of the City Engineer, proved so satisfactory that the City Council, in December, 1930, passed an ordinance establishing an "Equipment Fund." The ordinance provided that all construction and maintenance equipment, except that in the Fire and Police Departments, should be placed under the jurisdiction of the City Engineer and operated under the "Equipment Fund." The ordinance further provided that all necessary accounting procedure for this department, should be installed and operated by the City Comptroller.

The City Engineer presented his plan of organization for the Equipment Department to the City Comptroller, who, in conformity therewith, set up thirteen subdivisions in the new department in order to provide the proper accounting needed. The subdivisions recommended and established are as follows:

1. Administration and Overhead
2. Repair Shop, General
3. Motor Transport Equipment
4. Road Oil Plants
5. Street Maintenance Equipment
6. Grading Construction Equipment
7. Paving Equipment
8. Sewers, Equipment
9. Bridge Construction Equipment
10. Gasoline Oil Stations
11. Contract Trucks
12. Manufacturing (sweeper brooms only)
13. Manufacturing (sundry)

Under each division, a schedule of accounts has been set up covering all items of operation, maintenance, purchase, and income. It will be noted that a few divisions are established whose functions are to perform specific services for other divisions included in the classification.

The Equipment Dispatcher

In the operation of this equipment by the City Engineer, each item of equipment is assigned to its particular job by a city dispatcher, who thus exercises full control, and knows, at all times, where each piece of equipment is located. The control of all equipment by one dispatcher results in greater economy in its use than under the old system; by which much equipment might stand idle for a considerable time, when it could have been employed in other parts of the city. All drivers and machine operators turn in duplicate operation reports daily to the city dispatcher. These are checked by him, and one copy retained, while the other is turned over to the chief timekeeper for payroll purposes, after which it goes to the tabulating division of the City Comptroller's office.

THE BUCKEYE TRACTION DITCHER OWNED BY THE CITY SEWER DEPARTMENT

Form No. 116 15M 2-31 J.

CITY ENGINEER'S DEPARTMENT
EQUIPMENT FUND
Filling Station—Daily Report

Sheet No. _____

Date _____

Station No. _____

Station Location _____

Div.	Equipment No.	Equipment Name	Hubmeter Reading	Gas Pump Meter Reading From	Gas Pump Meter Reading To	Gasoline High Gal.	Gasoline Low Gal.	Oil Lubricating Qts.	Oil Hone Qts.	Grease Gear Lbs.	Grease Cup Lbs.	Alcohol Qts.	Kerosene Qts.		Issued by
On Hand Morning															
Received															
Total															
Issued															
On Hand Evening															

NOTE—
This form to be used for Gas Station
Issues of all stock so handled.

Form 160 15M 2-31

EQUIPMENT REPAIRS AND BUILDING MAINTENANCE DAILY REPORT
CITY ENGINEER'S DEPARTMENT

Date _____ 1931 | Approved by— | Start Time _____ M
Name _____ Man No. | | Stop Time _____ M
Gang No. _____ Occupation _____ Rate | Timekeeper _____
Foreman _____

Fund	Div.	Kind of Work	Acct.	Operation	Equipment Service	Equipment Number	Equipment Name	Hrs.	Amount

NOTE—Information in heavy type must be made in the **field.** This **report must be turned in daily** if men is to be paid.

Form No. 601 20M-12-29

CITY ENGINEER'S DEPARTMENT
EQUIPMENT FUND
Equipment Operating Daily Report

Must be turned in daily if Operators and Helpers are to be paid.

Date _____ Dept. No. _____ Fund No _____ Account No. _____
Commodity No. _____ **Operator No.** _____ **Name** _____ **Hrs.** _____ Rate _____ Amount _____
Commodity No. _____ **Helper's No.** _____ **Name** _____ **Hrs.** _____ Rate _____ Amount _____
Equipment No. _____ **Equipment Name** _____ **Time Out** _____ M
Equipment No. _____ **Equipment Name** _____ **Time In** _____ M

Kind of Work	Oper. No.	Dist. No.	Class	Street or Route No.	STREET	FROM	TO	EQUIPMENT Hrs	EQUIPMENT Rate	EQUIPMENT Amount	Miles	Cu. Yds.

TIMEKEEPER _____ FOREMAN _____

NOTE—Information in **Heavy Type** must be made out in the **Field.**
This form to be used for all kinds of work including snow removal, for the purpose of Equipment Operating Expense and Street Maintenance Equipment Cost.

Form No. 130 20M 12-30

CITY ENGINEER'S DEPARTMENT
Equipment Fund—Stores Requisition

Requisition No. _____ Storehouse No. _____ Date _____
Charge Acct. No. _____ Charge Oper. No. _____
Commodity No. _____ Equip. No. _____
Used For _____

QUANTITY	COMMODITY NUMBER	ARTICLE

FOREMAN

White copy to Comptroller.
Yellow copy to Engineer.
Manila copy for Bin Record.

Received By _____ STOREKEEPER

		PRICE	AMOUNT	

Samples of Forms Used To Show Operation of Equipment in Minneapolis

Every piece of major equipment bears a number within its own classification group. In addition to this, all invoices, operator's reports, and shop tickets, are coded in the tabulating division of the Comptroller's office, and duly tabulated. This makes possible a complete detailed record of each piece of equipment, showing cost of operation and maintenance, as well as income. It will readily be seen that it is a simple matter to make comparisons of costs of operation and maintenance and income of the various pieces of equipment within each particular group.

Rentals and Transfer

In establishing rental rates for the various pieces of equipment in each group classification, due consideration is given to all elements of cost entering into operation and maintenance, including depreciation. Depreciation charges on each item of equipment are credited to a depreciation reserve, and in this way provision is made to replace the equipment at the end of its usefulness.

When the equipment owned by the various city departments was consolidated under the Equipment Department, the various departments issued bills against the new department, in order to be reimbursed for the assets transferred.

Under the present management of the City Engineering Department, and the Superintendent of Streets, who has charge of equipment, this department gives assurance of being self-supporting. When a comparison of results under the present method of operation is made with the decentralized method previously used, the advantages accruing from the centralized method, now in use, are startlingly obvious.

Better Fire Protection Provisions Urged in Subdivision Design

ONE of the most important considerations in subdivision regulations is one that is most often overlooked, according to Latham C. Squire, Vice-President, Technical Advisory Corporation, New York City, who made these statements in a paper presented at the recent conference of the Westchester County Planning Federation:

"In the so-called 'private' or isolated subdivision which has been inefficiently designed, there is usually only one entrance and no possible means of communication with the adjoining subdivisions. This total lack of system of thoroughfares almost invariably presents great difficulties and causes delays to fire-fighting equipment in reaching a fire. Of course this results in decidedly higher rates to the property owners for fire insurance and in increased cost to the community in providing equipment to protect the properties.

The New York State planning enabling act, under the head 'Additional Requisites,' says: 'In approving such plats the planning board shall require that the streets and highways shall be of sufficient width and suitably located to afford adequate light, air, and access of fire-fighting equipment to buildings.' Attention is usually given to the width and alignment of streets in proposed subdivision plats in order to assure sufficient light and air and to accommodate the necessary traffic, but very little study is given as a rule to the important consideration of fire protection. Streets and highways are channels through which fire apparatus must pass to arrive at a fire. Poorly designed streets greatly increase the time required to move, and add to the maneuvering difficulties of fire-fighting apparatus. Insufficient street capacity increases difficulty of access to the hydrants and the stretching of the hose.

"Dead-end streets, unless carefully designed, particularly those that terminate at a municipal boundary, are usually attended by dead-end water mains with reduced pressures. This greatly handicaps the exchange of fire-fighting services between municipalities in time of need for outside assistance.

"In the design of local streets in subdivisions, consideration must be given to the fact that parking is likely to occur on both sides of the street and that provision must be made at *all* times for the movement of fire apparatus.

"Wide boulevards are ideal from a fire protection point of view. They not only provide a good fire line, but act as conflagration stops, dividing municipalities into fire divisions.

"Block length is another important consideration. A happy medium must be arrived at between the long block which saves paving costs and the short block for facilitating the movement of fire apparatus.

"It must always be kept in mind that fire apparatus must be quickly moved in all kinds of weather. A steep grade, a bad curve, or a railroad grade crossing, particularly in winter, may needlessly cause the loss of many lives and thousands of dollars' worth of property."

A Civic Association Uses Graphic Method Tellingly

"CIVIC Groups Meet Test of Stability Successfully" is the title of a display article in the current issue of *Minneapolis*. In it, Perry S. Williams, Executive Secretary of the Minneapolis Civic and Commerce Association, reviews the organization's outstanding public service achievements for 1931, using a swift and vivid reportorial style refreshingly in contrast with the more familiar annual statement with labored descriptions and lengthy tabulations. Twelve of the most outstanding accomplishments are illustrated with black and white drawings distinctive in their simplicity, economy and clarity. The three reproduced give an idea of the technique employed.

Fighting Your City Traffic Accidents with Education and Organization

The Third of a Series of Three Articles Suggesting a City Program to Win the National Traffic Safety Contest

By SIDNEY J. WILLIAMS
Director, Public Safety Division,
National Safety Council

THERE is no doubt that the seven cities which win, in their respective population groups, the coveted "Safest City" awards in the National Traffic Safety Contest for 1932, will do so largely as the result of the effectiveness of their programs in community safety organization and community safety education.

This is only another way of saying that the one biggest factor for your city to consider, in carrying out your plans to win this contest, is the *human* factor. The engineering facilities that are available or that may be developed to fight your traffic accidents of course will be important. Your traffic ordinances, and the legal and technical facilities for the enforcement of these ordinances, will be important. But you must have, in addition, a consistent and a developing public support of your traffic safety program. It is conceivable that a city might have the very best of such engineering equipment as signs, signals, through street system, safety islands and the like, supplemented by a model ordinance, a specialized traffic court and a traffic violations bureau, and still this city might fail to improve its safety record because of lack of public support of the safety program.

If your city has not yet made adequate traffic engineering improvements, you will be able to secure them only in so far as the citizens are educated to appreciate the need of such improvements and, where necessary, to pay for them through taxation. Likewise, the traffic laws will be observed only when the great majority of the citizens observe them voluntarily and support strict enforcement by your officials.

Coordinating All the Safety Agencies

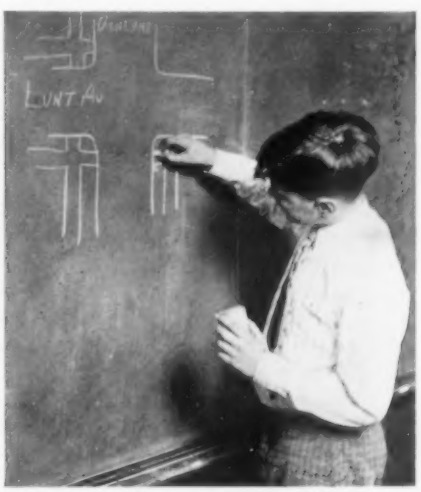
It is the purpose of this article to outline some of the essentials of a traffic safety program—to describe some practical methods which cities and states have used and can use to make such a program more effective.

A first necessity in your city campaign to win the National Traffic Safety Contest is a suitable committee or organization to plan the campaign and to coordinate the work of all city departments, groups and individuals that are to assist. But it should be remembered as a basic principle that the public officials of your city, through

Cities Entered in the Contest

357 cities in 48 different states have entered the National Traffic Safety Contest for "Safest City" awards. This list includes more than 74 per cent of all cities of the United States over 100,000, and represents approximately 30 millions of population. The states with the largest number of cities entered are Massachusetts (103), New Jersey (27), Michigan (19), Illinois (17). The award of the "Safest State" will be based on respective state records of (1) largest percentage of eligible cities in the contest and (2) the traffic accident achievement records of these cities. The contest is for the entire year 1932.*

* The original final date of entry was January 31; but because of urgent requests from state organizations which were encouraging their respective cities to enter, the final date of entry was extended to February 15, 1932.



SAFETY AT A CHICAGO SCHOOL

The boy with the uniform belt and cap is a schoolboy patrol officer on duty. The boy at the board is describing a dangerous crossing near the Junior High School

their election or appointment, have been delegated with primary responsibility for the safety of the citizens. No unofficial safety organization or campaign should assume any of the functions or responsibilities of these officials. However, your committee or organization should cooperate to the fullest extent with such official agencies. The committee can help them in inaugurating improved traffic safety methods and can arouse public support for the official activities.

Your supervising safety organization may be the local safety council, city safety committee, chamber of commerce, automobile club, the American Legion, or a civic club such as Kiwanis, Lions or Rotary. But remember that the safety organization, no matter how broadly constituted, cannot handle the traffic safety problems alone. It is the business of your organization to "sell" the need of the safety program to all local organizations and groups of the community, both official and unofficial, who should take over appropriate parts of your program. Thus, your organization would itself conduct only those activities which do not properly belong elsewhere.

The National Safety Council, in a leaflet on "Essentials of a Community Safety Program" has summarized four classifications of persons and groups which your safety organization, if possible, should include:

1. Men who have an economic interest in the accident problem, such as the president or general manager of the street-railway company and of the taxicab company, representatives of the industries, retail merchants, auto dealers and insurance interests.
2. Men having a public responsibility for accident prevention, such as the mayor, commissioner of safety, chief of police, fire chief, health officer, and city engineer.
3. Public-spirited citizens and representatives of community organizations directly interested, such as the chamber of commerce, motor club, parent-teacher associations and women's clubs.
4. People who can assist in the promotion of activities, such as the school authorities, the churches, luncheon clubs, etc.

An organization with such a personnel should command a high degree of public confidence. The entire organization should act as a unit in all matters which pertain to the policy, program and financing of the traffic contest activities, but you probably will be able to promote specific activities more effectively through special committees within this group. Your president, vice-president and committeemen should be voluntary workers.

A Program of Attainable Objectives

In a community safety program it usually is best not to attempt too many activities at first. Concentrate at first only on the most important traffic safety needs of the community. The program that is too ambitious often leads to discouragement and failure. On the other hand, if the community will vigorously push only a few practical activities to lessen traffic accidents, you doubtless will be able to achieve enough results to firmly establish your safety organization, and you can gradually broaden your activities to include all community accident problems. Though it is best to start with only a few activities, you should have on file a complete outline of all community safety objectives. Such an outline naturally would be broader than traffic safety alone. It should recognize all important community accident hazards, and should summarize what you consider to be the essential ultimate activities toward the control of these hazards.

Based on years of experience, the National Safety Council has outlined the following nine major activities which are assumed to be essential in a fully rounded safety program for an average community: (1) statistics; (2) traffic (ordinances and engineering); (3) public education; (4) child safety; (5) commercial vehicles; (6) law enforcement; (7) home safety; (8) industrial safety; (9) fire prevention.

Three of these activities—statistics, traffic, law enforcement—have been considered in the two previous articles of this series. Three more of these activities—home safety, industrial safety, fire prevention—are not directly associated with a community traffic safety program.

The three remaining major activities—public education, child education and commercial vehicles—we desire especially to emphasize in this article. Corresponding to these three activities, in the official grading schedule for the selection of "safest cities" a maximum of ten points will be awarded on child safety, ten points on public education, and ten points on community safety organization.

In the "Essentials of a Community Safety Program" it is recommended, as public education activities, that the committee should (a) develop newspaper publicity; (b) conduct safety meetings, and develop a speakers' bureau to provide speakers for meetings of all kinds; (c) display safety posters on street poster boards and in other public places; (d) conduct special safety education campaigns, brake inspection campaigns; (e) show safety films.

Public Education Accomplishments

There are many examples of successful public education programs to promote community traffic safety accomplishments. One example is that of the St. Louis Safety Council. Some years ago this Council conducted a city traffic survey, and then organized a city-wide safety conference. This developed a comprehensive plan of activities for different groups, including a program of public safety education toward better enforcement of traffic ordinances. As one specific example of results, the Council sponsored a new ordinance requiring vehicles to stop while street cars were loading and unloading, which reduced accidents from this cause by more than one-half.

The Evanston, Ill., Safety Council affords an example of efficient work in a smaller city. The Council, entirely through volunteer work, organized public support of police activities in a new program of enforcement of traffic violations, which reduced accidents 30 per cent the first year.

The Milwaukee Safety Commisison, with members appointed by the Mayor and activities financed by city appropriations and with advisory city authority, is another model. The Commission supervised a city traffic survey, promoted a stabilized enforcement program, and has stimulated public interest in observance of traffic laws.

Through the work of the Berkeley, Calif., Traffic Safety Commission, that city was among the comparatively few cities of its size in the United States which reduced motor-vehicle fatalities during 1931. The Commission, which includes leading men and women and represents leading city interests, was organized in the summer of 1925, following a wave of traffic accidents. Safety films were produced, a safety campaign was organized in schools, and

improvements were made in traffic engineering facilities.

The Rochester, N. Y., Chamber of Commerce Safety Council is another example of effective work in traffic safety. Nearly fifteen years ago Rochester conducted the first extensive community safety program among American cities. As a result, this city has continuously maintained a low accident record; for example, it won the 1929 "Safest City" award of the National Safety Council. The activities include traffic safety studies, commercial vehicle fleet contests, safety instruction in schools, and Junior Safety Councils and safety patrols.

Safety Instruction in Schools

A great deal of the safety educational work of a city amibtious to win the National Traffic Safety Contest naturally will relate to children. There is considerable evidence of definite results in this field. A recent investigation by the National Safety Council indicates that for the eight-year period from 1920 to 1929 accidental deaths from automobiles, for all ages of persons, increased 107 per cent, but automobile deaths of children under 13 increased only 27 per cent. This favorable result undoubtedly is due in large part to the increasing safety instruction of children in our schools and homes. Thousands of schools are making safety education a definite part of their curriculum. In the "Essentials of a Community Safety Program" the following activities are recommended:

a. Encourage schools to develop a program of classroom instruction.

b. Organize Junior Safety Councils in elementary schools, both public and parochial.

c. Use classroom posters and lesson outlines.

d. Develop safety activity in high schools, including instruction in safe driving.

e. Carry out a program on playgrounds and water safety.

Various Items of Progress in Community Safety

A large part of the activities of an effective community safety program will relate to the safety education of adults. The usual methods are through newspaper publicity, safety radio programs, display of public safety posters, and the organization of special traffic campaigns during the year. A good example of effective results is how Los Angeles "put over" pedestrian regulations by means of a six-weeks previous program of traffic safety publicity through newspapers, radio and public meetings.

The Newark Safety Council has developed public interest in a campaign against hit-and-run automobile drivers, through presentation of gold watches to boys who have assisted in the capture of such drivers. Safety leaders of Baltimore, the city which won the 1930 "Safest City" award of the National Safety Council, credit the city's record largely to its long-continued safety educational campaign among school children, which has reduced child traffic deaths almost by half.

The Etowah County (Alabama) Safety Council affords a good example of what may be accomplished for safety through a limited fund of $1,000, accumulated in a membership drive.

Allentown, Pa., since 1927 has reduced child fatality accidents by more than 62 per cent, through a city accident spot map and traffic safety instructions for all school children.

The Pittsburgh Motor Club for the past seven years has been conducting a weekly safety broadcast. Many city police departments, safety councils and other organizations are regularly using the daily safety radiogram releases of the National Safety Council. Houston, Texas, through a committee appointed by the Mayor, has been promoting traffic safety through the distribution of thousands of copies of rules and regulations on driving, safety films in local theaters, radio talks, and safety instruction in public schools.

Many cities are conducting local commercial fleet safety contests. Most of these are under the auspices of local safety councils; and in some cities individual local fleets are entered in the National Commercial Vehicle Fleet Contest of the National Safety Council for the six-months period ending June 30, 1932. Proof of the value of increasing safety training for commercial vehicle drivers is afforded by the fact that during the period from 1927 to 1930 fatalities caused by motor passenger cars increased 37 per cent, and fatalities from commercial vehicles *decreased* 19.3 per cent.

Many communities conduct safety training schools for men and women drivers. The Berkeley Traffic and Driving School, organized by the Berkeley Traffic Safety Commission, offers without cost five two-hour sessions and a final examination. More than 300 commercial vehicle drivers attended the opening of the recent Minneapolis Automobile Club Safety School, and 500 others were turned away for lack of space. The Chattanooga Safety Council recently conducted a drivers' school, and 152 of the 241 enrolled were awarded certificates. At the Evanston Drivers' School for women, 288 took the final test and 188 passed. About 400 women enrolled in a recent annual session of the Institute for Women Drivers conducted by the Detroit Federation of Women's Clubs. In Philadelphia, the Citizens Safety Committee awards certificates to all commercial drivers with no accidents during the previous calendar year.

In Minneapolis, Levi M. Hall, when Judge of the Municipal Court, often sentenced young traffic violators to attend the five traffic training classes of the school conducted by the Automobile Club of Minneapolis. Several months after five classes with a total of 1,822 pupils had been conducted, only 8 of this number had been arrested for a second violation.

The Essentials of Your Community Safety Program

Your community safety education must be continuous. It must represent a progressive program especially adapted to the immediate traffic safety needs of your community. And your safety organization must be built around these immediate needs.

In the official rating of your community safety organization, the judges will recognize any type which "actually constitutes an active, energetic force working constantly for safety in the community," and which assists and supports and does not usurp the duties of public officials. Your organization will be rated specifically on "its activity program, list of working committees, number of committee meetings conducted, and other details to show an active program commensurate with the size and conditions of the community."

TRAFFIC CONTROL AND FACILITATION

Conducted by the Institute of Traffic Engineers, 175 Fifth Avenue, New York

Publications Committee: Maxwell Halsey, Chairman, Hawley S. Simpson, Harry H. Hemmings, Arthur G. Straetz, P. J. Stupka

Los Angeles Traffic Surveys

DURING the latter part of 1931 the traffic and lighting department of the city of Los Angeles completed a cordon count, a study of curb and off-parking, and a speed survey of the central business district, according to R. T. Dorsey, Traffic Engineer.

The cordon count covered an area of 1 to 37 square miles from 7 A.M. to 7 P.M. and showed the following results:

Date of Count	Autos	Passengers in Autos	Street Cars	Busses	Average Persons per Auto
Wednesday, December 16, 1931....	276,753	418,725	5,845	774	1.51
Thursday, December 17, 1931.....	274,874	436,184	5,829	796	1.59

The figures compiled by the off-street parking survey were as follows:

Parking Places	No.	Actual Capacity	Daily Turnover	Theoretical Turnover on 1-Hr. Basis for 11 Hrs.
Public garages	99	14,063	11,950	154,693
Public auto parks	312	32,929	37,350	362,219
Total	411	46,992	49,300	516,912
Private garages	71	5,461	4,534	60,071
Private auto parks	120	3,989	1,887	43,879
Total	191	9,450	6,421	103,950
Garages	170	19,524	16,484	214,764
Auto parks	432	36,918	38,237	406,098
Grand total	602	56,442	54,721	620,862

In Minneapolis

ACCORDING to J. G. Vincent, Traffic Engineer of Minneapolis, "Inspection of corner lots with the shrubbery and plantings obstructing vision around corners, whose owners have been served request notices, reveals that approximately 30 per cent of the owners have voluntarily obeyed these requests."

A street-lighting survey has been completed by Kirk M. Reid, Illuminating Engineer, Nela Park Engineering Department of the General Electric Co., and by this time next year data will be available to show the relationship of street lighting to accidents. Several recent installations have been made which make adequate comparisons possible.

The Trolley Bus

J. C. THIRLWALL, of the Transportation Engineering Department of the General Electric Co., in a paper given before a local section of the American Institute of Electrical Engineers at Providence, R. I., has given the history and relative position of one of our latest transportation units—the trolley bus. He points out the advantages of rapid-transit lines in urban centers, but shows the tremendous fixed charges which must be justified by exceedingly heavy passenger demand. This situation has been responsible for the introduction of gasoline busses whose routes can be equipped for one-quarter to two-thirds the cost of rail routes. The difficulties encountered with the gasoline busses are: a high cost of power and maintenance per passenger seat as compared to modern rail cars; less comfortable seating and lighting; increased odors due to fumes; and the physical strain on the bus driver due to the clutch and transmission. This latter difficulty led to the introduction of some 2,500 gas-electric drive busses. The maintenance and power cost, however, still remained about twice that of single-truck street cars of the same capacity.

Thus the modern trolley bus was developed to obtain the low power and maintenance cost of rail equipment with an investment not too far above that of the gas bus. The costs of vehicles and garage facilities are closely comparable. If poles are available, the additional excess investment of the trolley bus would probably average $4,000 to $5,000 a mile. With any reasonable frequency of service up to 20-minute headway, the operating economics of the trolley bus would show a substantial return on the additional investment.

The trolley bus has a higher acceleration, and Detroit found it possible to make from 11 per cent to 16 per cent faster schedules than with their highest powered gas busses. This is largely due to the greater and more consistent pulling power of electricity obtained at present for busses.

Mr. Thirlwall believes that the trolley bus offers a solution to many urban transportation problems. It will not replace the gas bus as a means of pioneering into light-traffic districts, nor the rail car on very heavy trunk-line surface, but provides an intermediate unit which can more economically serve certain passenger volume demands.

Traffic Accidents Reduced in San Francisco

ALTHOUGH California as a whole had an increase of 22 per cent in traffic fatalities last year, San Francisco had an 18 per cent decrease, according to Captain Charles Goff, commanding the Police Traffic Squad. The number of fatalities for the last five years was as follows: in 1927, 132; in 1928, 117; in 1929, 98; in 1930, 114; in 1931, 94.

Through cooperation of local authorities, the enrolment of 2,800 school children as traffic "cops," the payment since 1927 of $306,000 in fines for violations of parking regulations, and the payment of $94,000 in fines for violating the speed limit, are cited as causes for the reduction. San Francisco also received the benefit of an intensive survey made under the direction of the Albert Russel Erskine Bureau for Street Traffic Research of Harvard University.

Houston Safety Activities Reduce Fatalities

THE Safety Department of the Houston Chamber of Commerce in a recent report summarizes its activities during 1931.

The Southwestern States' Safety Conference held its 1931 meeting in Houston, over 500 persons registered and all phases of safety were discussed.

The Safety Department assumed leadership in a state-wide campaign for the Driver's License Bill, which was defeated by a majority of ten. Since the defeat greater interest has developed and it is anticipated that such a bill will pass at the next meeting of the Legislature.

A traffic survey was recommended for Houston, and Earl J. Reeder, Traffic Engineer of the National Safety Council, was suggested. The Chamber of Commerce made it a Chamber project and offered to underwrite the expenses. The city deemed the time inopportune and suggested a Mayor's Traffic Committee, which has been very active.

An intensive educational campaign has been carried on: 75,000 copies of the city traffic regulations have been distributed; one safety program a week has been given over two radio stations; and the city has been entered in the National Inter-City Traffic Safety Contest of the National Safety Council.

An Inter-School Accident Reporting contest has brought the entire public school system into close cooperation with the Safety Department. Junior Safety Councils and Junior Safety Patrols are being organized in all the schools.

These activities have resulted in a reduction of 24 per cent in fatalities.

New Orleans Eliminates Yellow Lights in Traffic Signals—But Soon Puts Them Back

FROM December 28 to January 6, 1932, the yellow lights were removed from almost all the traffic signals in New Orleans in an attempt to shorten the length of the cycles. The motive was commendatory, but when it became generally understood that the change had been followed by an increase of accidents, the yellow lights were restored. The newspapers thoroughly condemned their elimination and were a factor in having them put back.

Uniform Traffic Laws Proposed for Nassau County

FACED with an increase of about 125 per cent in fatalities and of 75 per cent in injuries during 1931 over 1930, a group headed by A. W. Skidmore, Police Chief of Nassau County, J. R. Crossley, Vice-President of the New York Automobile Club, and F. E. McCahill, Deputy Chief of the Nassau County Police, have prepared a plan for the mayors and chief executives of the cities, towns and villages in the county. The committee feels that the fact that there are 54 different jurisdictions in the county has caused a lack of uniformity in control which has increased accidents.

The committee recommends the following:

1. Replacement of old speed signs by uniform ones
2. Prohibition of turns on the red light unless permitted by sign attached to the signal.
3. Adoption of a uniform color cycle in traffic signals
4. Elimination of all blinker type beacons now in the middle of the highways

This action is concurrent with the traffic survey now being carried on with the use of unemployed men.

Baltimore Traffic Conditions

THE Traffic Committee of the Baltimore Safety Council, composed of Preston D. Callum, Chairman, Holger Jensen, and John P. Rostmeyer, expressed their opinions regarding the traffic problems in Baltimore in a recent report. They entertain the conviction that there is much room for improvement and that traffic casualties can be materially reduced, and outline a preliminary program.

The Committee's first recommendation is a Street Traffic Commission—*one responsible body* composed of three to five members, to act as a *deciding* voice in traffic matters. They state that the traffic problem is a continuing one and that a permanent non-political body must be established.

Under traffic engineering they recommend that municipal accident records, field studies, specific recommendations to the proper authorities, and a study of the problem of congestion from the standpoint of accident causation, be considered.

In the police department, a traffic school for officers, triplicate tags, an accident investigation squad and additional motorcycle squads are recommended.

In the courts, a minor traffic violations bureau, more accurate records, adequate penalties and a study of accident repeaters are recommended.

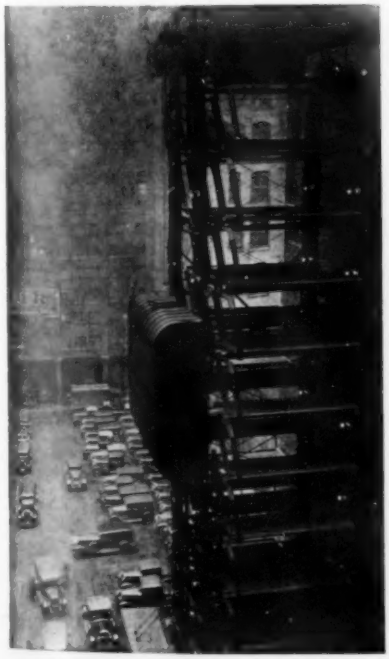
Increased educational activity, more uniform regulations, and increased use of the streets for movement instead of parking, are also recommended.

The Committee states that no further time should be wasted in studying what should be done—what is now needed is prompt constructive action.

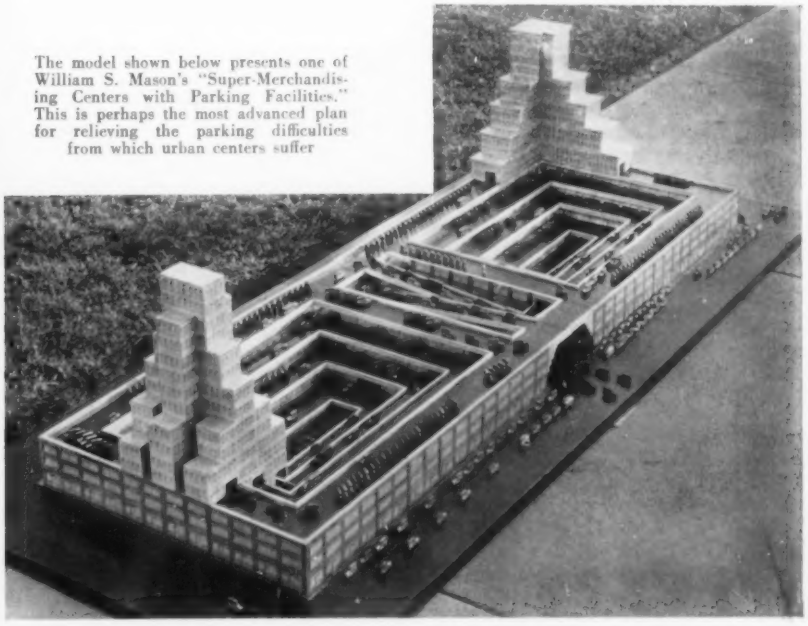
Uniform Grade Crossing Signals

WHAT is believed to be the best thought on "Railroad Highway Grade Crossing Protection — Recommended Standards" has been incorporated in Bulletin No. 1 of the Joint Committee on Grade Crossing Protection of the American Railway Association (Transportation Building, Washington, D. C.). Many different kinds of crossing signals are in use and often highway users do not understand their meaning. It is believed that fatalities may be materially reduced by the introduction of uniform highway grade crossing signals, so that a motorist, no matter where he may be, will immediately recognize the warning.

Radical Ways of Relieving Parking Congestion



The model shown below presents one of William S. Mason's "Super-Merchandising Centers with Parking Facilities." This is perhaps the most advanced plan for relieving the parking difficulties from which urban centers suffer



AT LEFT.—WESTINGHOUSE VERTICAL PARKING MACHINE RECENTLY INSTALLED IN THE LOOP, CHICAGO. AT RIGHT.—BUILDING PARKING FACILITIES INTO BUILDINGS

FORWARD STEPS

Reported by
Municipal Officials, Chamber of Commerce Executives, and Others

EXTERIOR, ORRVILLE POWER PLANT

Additional Power for City Utilities

ORRVILLE, OHIO.—Contrary to the experience of most of the large power systems, Orrville's municipal electric department has continued to grow during the last two years. The growth in output and capacity demand is well up to predictions made in 1928, when a program of expansion was laid out. Brick and steel structures were built, overtopping and surrounding the old dilapidated buildings and additions. A new stoker-fired boiler was commissioned in 1930, served by a new brick chimney and breeching; the last was later extended to accommodate two old boilers now left in reserve. Complete coal-handling equipment, elevator and storage silo were installed, along with an ash conveyor, and a combination feed-water heater-softener for the boiler feed.

For 1932 the original layout plans are under way, with contracts signed for a 1,500-kw. high-pressure steam turbine-generator unit with condenser and auxiliaries. This equipment is bought to include erection on new foundations put in by the city and with piping and other associated equipment handled by city forces.

The financing for all improvements, including a 750-kw. turbo unit installed in 1924, has been arranged from electric plant earnings. Upwards of $170,000 will have been reinvested in the power plant and pumping station in five years, within which period, too, over $17,000 has been cleared to extinguish the last installments of the original light-plant bonds.

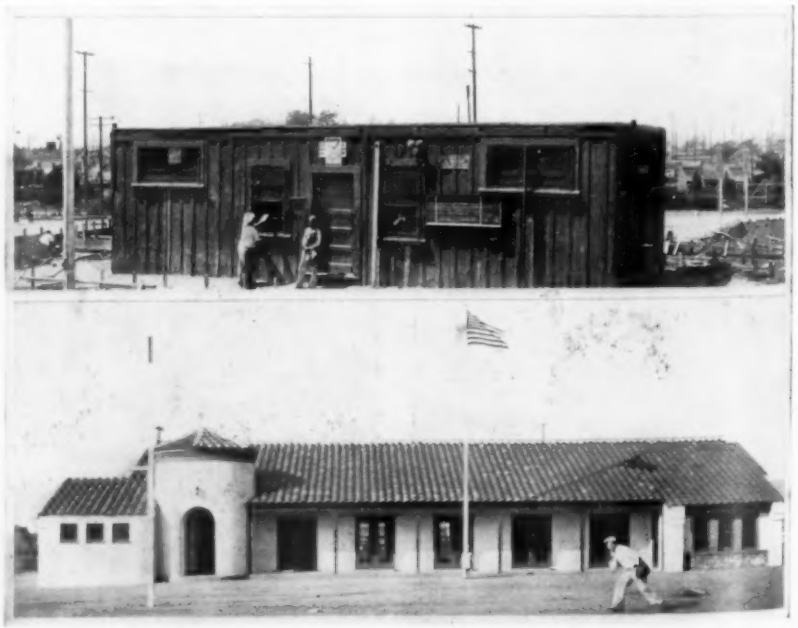
Orrville's electric rates are well known as resulting in the lowest charges in any similar-sized city in this section. Two-cent electricity has been available for residence use of over 100 kwh. per month for the last two years; now the cost of the first 100 kwh. is $3.50. Energy for extensive street lighting and public use is furnished without charge, with the municipal light department responsible for lighting units, traffic signals, etc. Considerable commercial lighting and industrial power load is also served at advantageous rates as compared to the rival power company's tariffs. The competitor's customers in town have dwindled to less than ten accounts. The municipal utilities are also securing rural load on about 50 miles of electric lines extending in many directions from the corporate limits. Farmers finance most of the cost of line extensions, but all work is done by the city line gang.

Probably no other village, in Ohio at least, has as much electric business as Orrville, with its 4,420 people. The water works and a profitable ice plant are also municipally owned. The management under Ohio Law is in the hands of an elected Board of Public Affairs of three trustees. The present trustees have been reelected for a third two-year term; one member will have served eight years continuously at the end of the current term. R. A. Kinney, J. D. Shallenberger and B. G. Cope are the trustees, Mr. Kinney serving as President of the Board.

A. D. WEBSTER,
Superintendent of Municipal Utilities.

To Serve the Living and Honor the Dead

BERKELEY, CALIF.—A recreation house for young and old, but principally for children, has recently been put into use in James Kenney Park, West Berkeley. The structure is of Spanish mission architecture, white, with a green roof and red door and window trimming. It was designed by James Plachek, Berkeley architect, and completed at a cost of $13,500, replacing an unattractive frame construction field house, and embodying some of the best and most modern ideas of practical recreation building planning. There is an auditorium with a seating capacity of 200, with a stage and ample dressing-room provisions. This large room is convertible into a dance hall. Folding doors divide it from a club-reading-room, and adjoining this is a kitchen. The office of the supervisor and the sup-



THE OLD AND THE NEW IN JAMES KENNEY PARK

ply room face on the playground. Two rear wings contain rest rooms and shower and locker rooms for men and boys and women and girls.

The structure is a distinct contribution to the already existing group of recreation centers in Berkeley's public parks. But it is more than a recreation building. It is a living memorial to a lover of children and a friend of civic progress; to James Kenney, first Chief of the volunteer fire department of Berkeley's early days, and Chief of the first paid department of the city, who died in a factory fire a stone's throw from the site of the new structure.

"Jim" Kenney's contribution to the developing life of the city from its early days was eloquently stressed at the dedication exercises by Judge William H. Waste, Chief Justice of the State Supreme Court, and his lifelong friend. Mayor T. E. Caldecott, City Manager Hollis R. Thompson, and Fire Chief George Haggerty, also participated in the program of dedication, as did city recreation officials and representatives of other municipal departments. August Vollmer, Berkeley's now famous Police Chief, paid especial tribute to the memory of an old associate. Chief Vollmer is said to have been influenced by Kenney to run for office 27 years ago when Berkeley was still a straggling village and when Vollmer was swept into office as Town Marshal at the head of a reform ticket.

One of the most impressive features of the dedication exercises was the unveiling of the bell-tower, which is in a patio opening from the auditorium. This contains the first fire bell used in the city, and a bronze commemorative plaque.

CHARLES W. DAVIS,
Superintendent of Recreation.

A Cemetery of Exceptional Beauty

LAUREL, MISS.—The Laurel cemetery is in two parts. The older portion is called Hickory Grove and is maintained by the Laurel Cemetery Association, which numbers scores of women as workers and subscribers. It has built a rest house, and keeps a corps of men. This older part of the cemetery is beautifully kept.

The new part is known as Lake Park, and is maintained by endowment. It is developed around a lake and the planting is very fine. Native shrubs have been used abundantly and the planting so planned that at no time of the year is the cemetery without bloom. The striking feature of Lake Park is that plots are shielded by trees and shrubs, and graves are, in all cases, simply marked.

The old portion and the new part of the cemetery merge. The effect is of a most beautiful park, bright with flowers and birds, with but little of the depressing effect so common to like places elsewhere.

HARRIET S. GIBBONS.

VIEWS OF THE LAUREL CEMETERY

The newer section, Lake Park, comprising 20 acres, was the gift of Mr. and Lauren C. Eastman, and is substantially endowed

Boulevard Continues Development of City Plan

HAMILTON, OHIO.—That a well-defined city plan can be of great aid in developing a city is being proved in Hamilton, where a new boulevard recently completed adds another link to the "outer drive" chain worked out by Harland Bartholomew, city planning engineer.

The new drive, work on which was done as a part of the city's unemployment program, is indicated on the accompanying photograph as a solid white line. At present it is a hard-surface road, but eventually it will be a paved highway, with a bridle path and a sidewalk.

The dotted line in the photograph shows the next extension of the boulevard, work on which will begin as soon as is found feasible. This will carry the road further around the outskirts of the city, and will bring the Bartholomew plan another step nearer completion.

The Hamilton city plan originated a dozen years ago when the Hamilton Chamber of Commerce secured Mr. Bartholomew's services in working out a coordinated program for the future. The plan as presented by the engineer is still used as a program for further developments, only minor changes occasioned by new conditions having been made.

The plan is complete in every detail. It fixes the width of new paved streets, sets the distance from the sidewalk for each new building constructed in the business district, sets off certain sections of the town for residential, industrial, and commercial districts, and provides for a park system and a complete boulevard system for the city.

The boulevard plan, of which the new road is but a small link, is interesting in itself. Hamilton is situated on both sides of the Great Miami River, nestling in a valley between two ranges of hills. Under the Bartholomew plan there will eventually be a complete outer drive circling the city, running through the more scenic sections of the hills, with the bridle and walking paths extended the full length of the drive.

The boulevard will be linked with the center of the city by drives running in, greatest of which will be the so-called Riverside Drive, which will run along the banks of the river. As a final feature, all these drives will be centered at a park to be constructed in what is now known as Peck's Addition, heretofore a slum district used as a dumping ground by the city. This improvement is expected to be made in the near future. Under the development plans a bond issue will be submitted to the voters, and if passed, bonds will be floated to secure the funds necessary for the work. The new drive has opened up formerly useless land, and the development of a beautiful residential district is seen as a result. In addition, the scenic beauties of the drive are in themselves enough to pay for its installation.

As another item in the Bartholomew plan, new buildings constructed on Third Street in the city have all been set back 10 feet from the old line, making possible the eventual widening of that street. Committees are now working with the city, county, and state governments, and the extension of North Third Street to neighboring towns and highway routes will come within the year. Finally, a dangerous railroad crossing in South Hamilton is to be replaced by an underpass.

There is no concerted effort to rush through improvements under the city plan, but as new roads have to be replaced, new improvements made, or new buildings constructed, they are fitted into the plan. The initial cost of developing it was relatively small; its results will repay that cost a hundredfold.

JOHN KAYLOR NORTHWAY,
Editor, *Hamilton's Business.*

Items in a Million-Dollar Recreation Program

LOS ANGELES, CALIF.—The construction program under terms of the $1,000,000 unemployment relief bond issue of the Los Angeles Playground and Recreation Department called for the following principal projects, most of which have already been completed, as stated:

Ten playground sites which had been lying idle in Los Angeles owing to lack of funds necessary for their improvement have been completely developed.

Seventeen community club houses and field houses have been added to the already large number of existing community buildings in the city. The experience of Los Angeles has been that community club-house buildings containing recreation halls, club rooms, kitchens, and similar facilities receive widespread use and are of great service to the district in which they are located.

Five gymnasiums providing for indoor sports and athletics of all types are included in the building program, also six new swimming pools, five completed and two under construction, and five bathhouses.

Three baseball diamonds, forty-four tennis courts, two wading pools, an aquarium, a beach lifeguard station, and the lighting of eleven baseball diamonds, thirty-two tennis courts, and seven playgrounds, were also among the improvements named.

Other projects were the construction of a beach pier recreation center, thirteen sprinkler systems, twenty-two horseshoe courts, nine basketball courts, seven volley-ball courts, a children's outdoor theater, and the landscaping and grading of many play centers.

Outstanding among the new recreational projects in Los Angeles is the city's huge swimming pool and stadium, now nearing completion in Olympic Park, a center that has been designated as headquarters for all aquatic competition in the 1932 Olympic Games.

Through this program of development, it has been possible to provide many facilities which have long been needed, but for which funds have not been available because the budget of the Playground and Recreation Department is now devoted to the operation of the existing system.

RAYMOND E. HOYT,
Supt., Playground and Recreation Dept.

THE HAMILTON BOULEVARD PLAN

STATISTICS MAP FOR SAN DIEGO, CALIF.

For each district there are recorded the number of subdivided lots and building sites; building sites occupied and vacant, and per cent occupied; houses and apartments; population; business front footage; and manufacturing, total and subdivided acreage. The map is dated January, 1932

Effect of Zoning Demonstrated by Maps and Statistics

SAN DIEGO, CALIF.—An exhaustive use survey was made as the basis for a zoning ordinance for this city in 1928, at which time considerable valuable information was accumulated. Since information to be valuable must be current, it was decided to keep it up to date yearly by using building permit records and such other data as are required.

We have, therefore, two large maps, each about 12 feet square, mounted in three sections, and drawn at a scale of 1 inch to 400 feet. One shows in color the use to which every piece of property in the city was devoted in 1928; lots used by single-family dwellings are shown in yellow, multiple-family use in orange, business in red, and manufacturing in purple. This map shows the general mixed use so often found in unzoned cities. The second map shows only those structures erected since 1928. The same color scheme is used for this, and it gives a remarkable demonstration of the concentration of buildings of similar use in various districts, residential, business and industry. These maps have elicited considerable comment and are a visual lesson in zoning.

In connection with this set of maps we compile the figures on the number of houses, apartments and front footage of business erected each year according to districts. We feel that in this way a closer touch is kept with those faster developing areas, and therefore city planning matters are kept more nearly in line with the growth and activity of private enterprise. On this statistics map, shown herewith, are indicated the different items studied and charted. In addition we compute the percentage growth in residential units; and it is interesting to note that of the three districts showing over a 50 per cent growth in the past four years two areas are still maintaining an excellent rate of growth (about 8 per cent the past year), while the other district has dropped considerably.

Many interesting facts become apparent by a close study of these statistics and their value can be attested by those agencies which have availed themselves of the information.

GLENN A. RICK,
City Planning Engineer.

City and County Acquire and Will Develop Old Fair Grounds

OCALA, FLA.—A recent valuable acquisition by the city of Ocala and county of Marion is a 38-acre tract used for the past quarter-century as county fair grounds. The local Chamber of Commerce spent much time and effort on this undertaking, dealing with many individuals who had personal claims on the grounds, and making satisfactory terms with the city in regard to paving assessments.

The tract is wholly within the city limits and will prove a rich asset to the future of city and county. The plan for its development, still in a tentative stage, is for a city park, an athletic field and exposition grounds, for central Florida. Such a plan, if officially adopted, would be carried out over a period of, say, ten years, unit by unit, as finances and needs justified. The first unit would probably be a grandstand adequate for city-county events, league baseball and other sports activities.

HORACE L. SMITH,
Secretary, Marion County Chamber of Commerce.

The Other Side of the Tax Problem

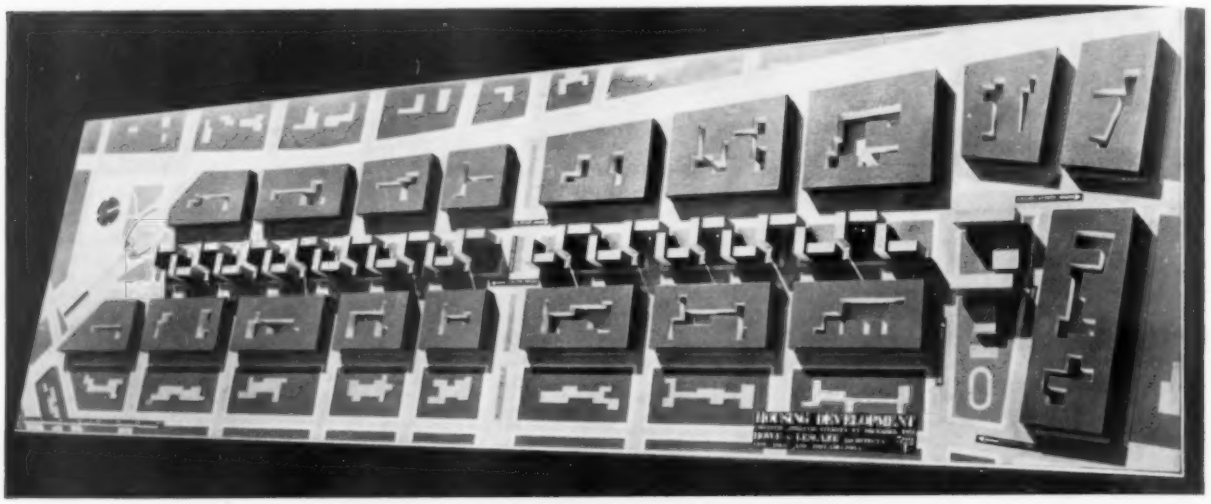
IT is certainly a topsy-turvy world when we are urged to increase or maintain our expenditures on true-fables magazines, useless gadgets for automobiles, or anything made by "productive" private industry, and at the same time to cut our expenditures on public libraries, health work, and eradication of insect pests. If frills must be eliminated, why should we not begin with some of the real frills of modern life?

WILLIAM ANDERSON,
Professor of Political Science, University of Minnesota, in *The Municipality*, February, 1932.

A Slum-Substitute Proposal for New York City

HOUSING authorities and others interested in better living conditions for low-wage groups of city dwellers are giving attention to models, drawings and plans by Howe and Lescaze representing a proposed development for the now-famous Chrystie-Forsyth area of New York, which are included in the international exhibition of architecture at the Museum of Modern Art in that city.

The principle embodied in this plan is one towards which the Regional Plan of New York and other authorities have for some time looked as the only solution for the existing congestion of the city's slum sections and for adequate recreation areas within them: that of "landlord" responsibility for light, air and a reasonable recreation space for all tenants.



DEVELOPMENT PLAN

(Above) The group of buildings running from left to right through the center of the plan shows the proposed new houses. Their ample open spaces are in striking contrast with the atrocious overcrowding of the land as shown by the models of the existing tenement houses on the adjacent blocks to the north and south

This comprises a park playground, 2,450 feet long, 125 feet wide; 85 stores; and 24 apartment buildings 9 stories high, with 5,616 rooms to rent for $10.95 or less per room per month. The total area of the development is 306,500 square feet (7 city blocks); the total area retained for playgrounds is 266,500 square feet. Approximately 41 per cent of the play space is under the apartment buildings, which are raised 14 feet from the ground, thus providing sheltered outdoor play on rainy days; 59 per cent of the park-playground space is completely open to the sun. This open area costs the city nothing, the buildings being designed to pay for themselves and the open spaces as well.

STEEL HOUSES ON STILTS

The upper drawing shows the playgrounds wide open to the sun and surrounded by buildings. The model of one of the 9-story apartment house group units shown below gives a good idea of the central-section details of the development plan. It also shows how traffic passes beneath the buildings

The park-playgrounds of each block are surrounded partly by stores and by a high wire fence with a locked gate for which each apartment dweller has a key, and which is, actually, his main front entrance to his home. The park-playground is supplemented by 61,000 square feet of roof space for recreation use.

Each of the 24 buildings is L-shaped and composed of two wings. Units are placed in alternating directions; short ones run north and south, long ones east and west. This arrangement means that windows of all living-rooms and bedrooms, and as many others as possible, face either east, west, or south, and that the living and bedroom windows of one wing never face those of another wing. It also means that windows of all north-south wings are 170-195 feet distant from houses across the street, instead of the usual 60 feet. Windows of all east-west wings are 80 feet distant from those of the next unit. Living-rooms and bedrooms have continuous windows the width of the room.

The stairways of the units are so arranged that children or adults, in traversing the complete length of the development, have to go through the traffic of only one street—the major one, Delancey, which is policed. They walk in a park-playground until they reach the stairway of a building erected over an intervening cross-street, ascend the stairway, cross above the street on the balcony-corridor, and descend the stairway on the other side. This is particularly effective planning for children going to the two blocks of schools, auditoriums, gymnasium, swimming pool, and athletic field planned for the blocks directly to the south of First Street.

There are no basements. Heat is to be supplied by the New York Steam Co. Each living-room is 11 by 17, each bedroom 9 by 14; each kitchen is equipped with laundry tubs, gas range, kitchen cabinet and refrigerators. All apartments are cross-ventilated and the entire development is fireproof.

The Municipal Bond Market

By SANDERS SHANKS, JR.
Editor, *The Bond Buyer*

FIVE months ago the flow of credit to municipalities was abruptly and almost completely shut off. Except to the extent that loans could be arranged, on an emergency basis, with local people or with state or local sinking-fund custodians, and with the exception of an extremely limited amount of long-term borrowing on bonds negotiated by a few of the larger communities with especially high credit ratings, municipalities have had to get along as best they could without borrowing.

The results of this frozen condition are seen in many "technical" defaults on maturing obligations, "payless" pay-days, curtailed welfare relief activities, abandonment of work on public improvement projects, and other evidences of a chaotic fiscal condition.

Actuated primarily by the widespread epidemic of bank failures, rather than through alarm over the financial stability of municipal borrowers, the banking community (bankers, bond dealers and bond investors) ceased making new loans to municipalities and threw on the market, with disastrous effect upon quotations, a huge amount of bonds previously acquired. Following this break-down in the normal machinery for financing municipalities, bankers rapidly developed quite definite apprehensions as to the ability of municipalities to support the burden of their debts—unless they undertook an immediate and drastic retrenchment in operating expenses. In support of this attitude, the banker points to increased tax delinquencies and reduced revenues from other sources and argues that, with real estate and other property values greatly deflated, the basis of taxation has been seriously narrowed. Debt service is a fixed charge; hence actual and anticipated deficits must be covered by equivalent savings in current operating budget reductions.

Naturally, there is a wide range of opinion on the subject, with the bankers and municipal governing authorities frequently disagreeing quite definitely.

While many communities readily agreed that the picture had completely changed and have already responded with reduced wages and budgets, lower tax rates and taxable valuations, others are not so willing to accept the new order of things.

So far, it appears that the communities which have adopted a policy of rigid retrenchment have found that the money markets remain about as tightly closed as ever. And, while it is not intended to suggest that retrenchment is not in order, the fact is that the underlying reason why municipalities, taken as a whole, are not able to borrow money today is to be found in an examination of the banking situation, not the financial condition of municipalities, nor the lack of faith among bond investors in the ultimate security of municipal obligations. If this is true, then it is reasonable to hope that progress being made in arresting deflation and thawing out the frozen credit situation will automatically restore to municipalities a normal volume of both short- and long-term credit.

The following is a list of recent sales of new issues of state and municipal bonds showing the net interest rate at which the loans were placed:

Amount	Municipality	Rate (%)	Maturity	Net Basis (%)
1,000,000	Delaware	4	1-40 yr. (opt.)	4.00
60,000	Coeur d' Alene, Idaho	4¾	12-1/3 yr. (avg.)	4.65
350,000	Oil City, Pa., School District	4¾	22¼ yr. (avg.)	4.72
2,122,000	Maryland	4¼	9½ yr. (avg.)	4.74
135,000	Burlington, Vt.	4½	26 yr. (avg.)	4.87
1,790,000	Buffalo, N. Y.	5	13 yr. (avg.)	4.93
750,000	Lincoln, Nebr.	5	10-15½ yr. (op. avg.)	4.95
616,000	Greenwich, Conn.	5	6¾ yr. (avg.)	5.00
400,000	Cumberland, Md.	4½	39¼ yr. (avg.)	5.16
1,500,000	St. Louis Co., Mo.	5	14 1/6 yr. (avg.)	5.19
375,000	Columbia Co., N. Y.	5½	7-1/6 yr. (avg.)	5.35
30,000	Middletown, Ohio	5½	6-1/6 yr. (avg.)	5.45
2,082,000	Syracuse, N. Y.	6	3 yr. (avg.)	5.99
3,000,000	Buffalo, N. Y.	6	3 yr.	5.99
1,900,000	Passaic, N. J.	6	1-5/6 yr. (avg.)	6.00
5,000,000	Newark, N. J.	6	20 1/6 yr. (avg.)	6.00
750,000	Salt Lake City, Utah	5	1 yr.	6.05

For Improvement of Land Condemnation Procedure

A THOROUGHGOING report on methods and results in the condemnation of land by the city of New York, prepared by Leonard M. Wallstein and presented to Arthur J. W. Hilly, Corporation Counsel of New York City, has recently been made public. Mr. Wallstein, Commissioner of Accounts in a former administration of the city, and for many years counsel for the Citizens' Union, has been acting as a special assistant corporation counsel, investigating condemnation proceedings and obtaining reductions in awards. He says of the present system:

"The existing method of valuing land acquired by condemnation by the city of New York is extragavant, wasteful, unfair to the city, frequently unfair to the private owner and beneficial to nobody except favored and profiteering real estate and political interests, or a combination of both, with their supporting staffs of specialists—lawyers and expert witnesses. To these the present system, with its innumerable delays, technicalities and loopholes, has afforded a safe, easy and vastly lucrative means of drawing upon the public treasury. If the deliberate intention has been to accomplish that result, the present system could hardly have been better designed to achieve it."

Mr. Wallstein makes a number of important recommendations to improve the procedure, for the benefit both of the city and of honest and reasonable landowners. They include:

Establishment of special condemnation tribunals consisting of three justices of the Supreme Court (a local court of original jurisdiction) in the First and Second Judicial Departments (covering New York City), with two justices acting as a quorum for trials and the third designated to pass upon motions, applications and legal questions. Under present procedure one Supreme Court justice handles an entire case.

Legal enactment of the principle that *bona fide* sales of property near the parcel to be condemned constitute the best evidence of fair market value of land.

Legal enactment of a statute permitting examination before trial in condemnation cases as a means of eliciting the truth about land values.

Reduction of delays to a minimum.

Establishment of a court rule in the Second Judicial Department (boroughs of Brooklyn, Queens and Richmond, also outlying portion of Long Island) prohibiting attorneys from soliciting condemnation cases, as it is prohibited by court rule in the First Department (boroughs of Manhattan and the Bronx).

Elimination of obscurity surrounding condemnation proceedings by having the Board of Estimate adopt rules requiring periodic published reports of the status, conduct and results of each case.

Coordination of the city's methods of acquiring land by direct purchase with the methods used in condemnation.

RECENT CITY MANAGER APPOINTMENTS

CHARLES E. BANNING was appointed the first City Manager of Milford, Del., on January 26.

John F. Donovan, City Manager of Auburn, N. Y., from January, 1928, to December, 1931, was appointed the first City Manager of New Rochelle, N. Y., on January 18. Mr. Donovan was engaged in engineering work for the Lehigh Valley Railroad Co. for seven years before entering city management.

Donald S. Sammis, a former Councilman of Stratford, Conn., was appointed Town Manager of Stratford on January 26, to succeed John B. Wright, who had been Manager since March, 1928.

Frank E. Sheehan, former director of the municipal water plant in Portsmouth, Ohio, was appointed City Manager to succeed C. A. Harrell, who became the first City Manager of Binghamton, N. Y., on January 1.

Arthur W. Stephens has been appointed Village Manager of Oak Park, Mich., to succeed Horace Woolcock.

E. L. Udell, Production Superintendent of the Department of Utilities in the city of Tallahassee, Fla., was appointed City Manager of Radford, Va., January 23. He succeeds H. W. Rankin, who resigned effective January 15.

H. A. Yancey, City Manager of Charlottesville, Va., since September, 1925, was appointed City Manager of Petersburg, Va., effective March 15. Mr. Yancey was City Engineer of Charlottesville previous to his entering the city manager profession.

CLARENCE E. RIDLEY,
Executive Director, The International City Managers' Association.

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Warren County

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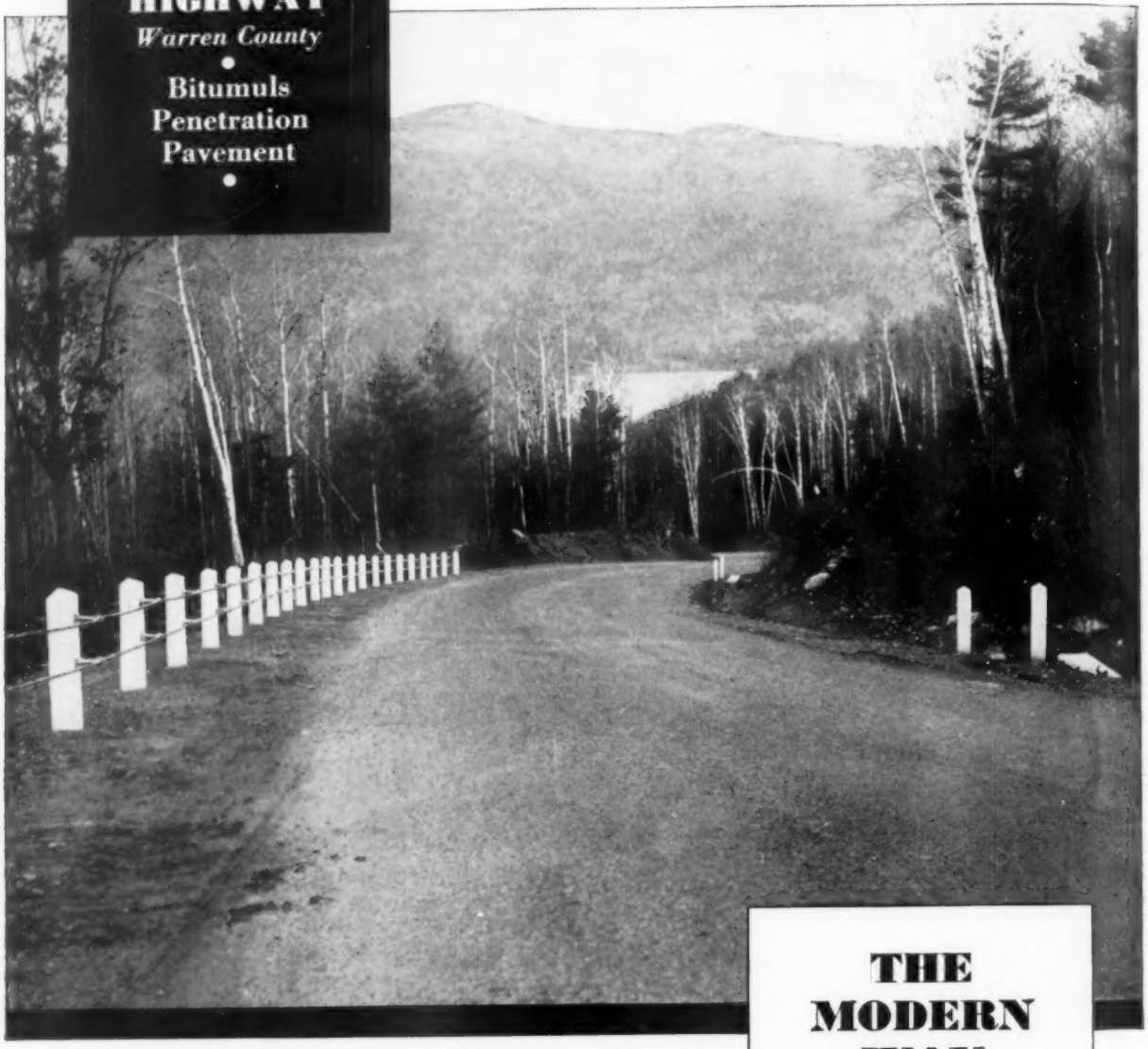

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THE CITY'S LEGAL RIGHTS AND DUTIES

Conducted by A. L. H. STREET, Attorney at Law

Accidents

Statutory provision for awards to persons injured by police officers upheld and applied to injury to pedestrian accidentally shot by policeman in pursuing robber (New York Supreme Court, Bronx County, Special Term: *Evans v. Berry*, 253 N. Y. 569).

Bond Redemption

Holders of bonds reciting issuance under cited statutes held bound by provision in such statutes authoring redemption at option of city earlier than maturities specified (Idaho Supreme Court: *Neighbors of Woodcraft v. City of Rupert*, 4 Pac. 2d, 360).

Cemeteries

Owners of cemetery not entitled to damages, in absence of statutory provision therefor, on adoption of a health measure forbidding further burials within city limits (California District Court of Appeal: *Hand v. City of Whittier*, 4 Pac. 2d, 273).

Debt Limits

City's contract to buy machinery, etc., for light plant out of plant revenues, including money to be paid by city for current sold to itself, at a profit, held violative of constitutional debt limitation (Missouri Supreme Court: *Hight v. City of Harrisonville*, 41 S. W. 2d, 155).

Dismissing Employees

Dismissal of employee on vacation of his office held not to violate civil service law (Iowa Supreme Court: *Kern v. City Council of City of Des Moines*, 239 N. W. 104).

Franchises

Company, or its receivers, continuing to exercise privileges of franchise after its expiration, held subject to its burdens (Missouri Supreme Court: *Bowers v. Kansas City Public Service Co.*, 41 S..W 2d, 810).

Electric franchise ordinance was void where a severable provision fixing irrevocable rates was invalid, although the ordinance received a majority vote under referendum, if invalid part may have influenced vote (South Dakota Supreme Court: *Haines v. Rapid City*, 238 N. W. 145).

Highway Repairs

Property owners held not entitled to mandamus to compel repair of highway, where duty to repair was not clearly imposed and where remedy existed by appeal to county board (Wisconsin Supreme Court: *State v. Rossier*, 238 N. W. 825).

Irregular Purchases

County held liable for reasonable value of road machinery retained and used under irregular contract of purchase (Nebraska Supreme Court: *Omaha Road Equipment Co. v. Thurston County*, 238 N. W. 919).

License Taxes

Ordinance imposing license tax upon card rooms not operated for profit held void, such operation not being a "business" (Utah Supreme Court: *Morgan v. Salt Lake City*, 3 Pac. 2d, 510).

Official Publications

Legal requirement for "advertising" an official matter is not satisfied by publishing an unofficial news item (California Supreme Court: *People v. City of San Buenaventura*, 3 Pac. 2d, 3).

Pedestrian Subways

Abutting property owner held entitled to award of damages for construction of pedestrian subway approach interfering with access between street and property (California Supreme Court: *MacCandless v. City of Los Angeles*, 4 Pac. 2d, 139).

Race Segregation

City held empowered to establish bathing beach and recreation park for colored citizens, even in the absence of expressly authorizing statute or charter provision (Virginia Supreme Court of Appeals: *Page v. Commonwealth*, 160 S. E. 33).

Street Improvements

Statute, authoring cities to reconstruct street-railway tracks, repave the street space occupied by the same, and assess part of the cost against the street-railway company and the other part against the city, held valid (Kansas Supreme Court: *State v. City of Kansas City*, 4 Pac. 2d, 422).

Street Opening

Municipality's delay in opening dedicated street held not to bar opening, although abutter had constructed building projecting into space (Oregon Supreme Court: *Killam v. Multnomah County*, 4 Pac. 2d, 323).

Tax Exemption

Statute exempting municipalities from tax on production and sale of electric power held valid; they being agencies of the state (United States District Court, Eastern District of South Carolina: *South Carolina Power Co. v. South Carolina Tax Commission*, 52 Fed. 2d, 515).

Tax Limits

Constitutional tax limit held not to prevent levy to pay judgments (Nebraska Supreme Court: *In re Proceedings of Board of Equalization*, 238 N. W. 735).

Utilities

Anti-Trust Law held inapplicable to city's monopoly of electric current sale, destroying business of gas company operating under franchise previously granted by city (Idaho Supreme Court: *Denman v. City of Idaho Falls*, 4 Pac. 2d, 361).

State's assumption of control over rates collectible under a pre-existing franchise held not to abrogate gas company's obligation to pay the city percentage of gross proceeds (Tennessee Supreme Court: *Lewis v. Nashville Gas & Heating Co.*, 40 S. W. 2d, 409).

Ordinance lowering gas rates held not to impair gas company's contract rights; the right to alter public utility rates being an inherent attribute of police power or sovereignty in the state (Arkansas Supreme Court: *Camden Gas Co. v. City of Camden*, 41 S. W. 2d, 979).

Workmen's Compensation

Accidental death of village marshal, caused by discharge of his pistol in his home, held not covered by compensation act (Nebraska Supreme Court: *Kresl v. Village of Dodge*, 238 N. W. 752).

Sewage Disposal

Lease of part of land for operation of municipal sewage disposal plant did not preclude lessor from recovering damages for decreased rental value of remaining land due to negligent operation of plant (Texas Court of Civil Appeals: *City of Iowa Park v. Cameron*, 36 S. W. 2d, 1097).

Sidewalks

County held liable for injury to pedestrian on bridge sidewalk, due to an expansion plate having arched and sprung itself 1½ or 2 inches above the sidewalk surface, the defective condition having been obvious for upwards of a month before the accident (New Jersey Supreme Court: *Kacsanik v. Passaic County*, 155 Atl. 751).

Street Assessments

Elevated railroad property in center of street held not subject to street improvement assessment in absence of statutory authority (Kentucky Court of Appeals: *Louisville & Nashville Railroad Co. v. City of Frankfort*, 40 S. W. 2d, 288).

Telephones

Monthly charge for dials on private branch individual telephones held not unjustly discriminatory because no charge made on dials furnished to individual line subscribers (Missouri Supreme Court: *State v. Public Service Commission*, 36 S. W. 2d, 947).

Traffic Regulations

Fire truck held to have had right-of-way over private truck at street intersection although "Stop" light was against fire truck (Washington Supreme Court: *Hartnett v. Standard Furniture Co.*, 299 Pac. 408).

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Prepared by
FRANK B. WILLIAMS
Author of "The Law of City Planning and Zoning"

ZONING and PLANNING NOTES

From Data collected by the Zoning Committee of New York (233 Broadway)

Eminent Domain

CALIFORNIA.—*East Bay Municipal Utility District v. City of Lodi*, 6 Pac. 2d. 325.—"Used" as employed in a statute exempting from eminent domain property while appropriated and "used" for public purposes, does not mean actual physical use, but reasonably probable use within a reasonable time. Evidence as to defendant city's financial condition, bonded indebtedness and ability to use the property involved is admissible.

Zoning—Business District

CALIFORNIA.—*Smith v. Collison*, 6 Pac. 2d. 277.—That three corners of an intersection are zoned for business and one for residence does not show unreasonable, arbitrary or discriminatory zoning.

Land Under Water

LOUISIANA.—*State v. Erwin*, 138 So. 84.—Where the water of Calcasieu Lake washed away parts of the surface of adjoining lands, thereby making the subsurface part of the bed of the lake, the state did not acquire such subsurface.

NEW JERSEY.—*Wynn v. Margate City*, 157 Atl. 565.—A zoning ordinance regulating the construction of buildings on lots applies to land under water, the word "land" in the ordinance including water.

Zoning—Three-Fourths Vote of Council

NEW JERSEY.—*Freint v. Borough of Dumont*, 157 Atl. 382.—The Borough Council was composed of six members, in addition the Mayor having the right to vote in case of tie. In certain zoning matters a three-fourths vote of the Council was required. It was contended that the Mayor was a member of the Council, and therefore six votes were necessary for a three-fourths vote. *Held*, that the vote of five members of the Council constituted a three-fourths vote.

Housing—Public Aid

NEW JERSEY.—*Simon v. O'Toole*, Court of Errors and Appeals, February, 1932.—This case, digested in these Notes for October, 1931, affirming the constitutionality, in New Jersey, of the appropriation of public funds in aid of housing, has been affirmed in the highest court of that state. It is one of the first decisions in this country to deal primarily with the housing problem in its public and police power aspects, and will undoubtedly be regarded as a leading case on the subject. The case is discussed by Spalding Frazer in his department, "Legal Notes and Comments," in *New Jersey Municipalities* for September, 1931, and also editorially in THE AMERICAN CITY for July, 1931 (page 129).

Zoning—Injunction

NEW YORK.—*Roock v. Womer*, 233 App. Div. 566.—The plaintiff, damaged by the erection of a building in violation of the zoning setback regulations of the city of Syracuse, is entitled, not only to an injunction, but to damages in the same proceeding.

Zoning—Industrial District

NEW YORK.—*Bove v. Downer-Hanna Coke Corporation*, 142 Misc. 329.—The complaint in this action for an injunction restraining the defendant from so operating its coke plant as to allow smoke, soot and gas to pass over plaintiff's premises in the city of Buffalo, and for money damages, must be dismissed, where the proof shows that the district in which such premises are located was predominantly devoted to transportation, traffic and heavy industrial plants when plaintiff acquired the land; that the location and the use of the plant are in a district expressly sanctioned by the zoning ordinance of the city of Buffalo, and there is nothing to show that the operation, construction and maintenance of the plant constitute a nuisance, particularly where the condition of which complaint is made is general and cannot be charged directly to defendant.

The fact that the defendant is under a contract with the United States Government is no defense to the action where there is nothing to show that the method of operating the plant has been specified or authorized by any legislative enactment or governmental decree.

Zoning—Residential District

OHIO.—*State ex rel. Clifton-Highland Co. v. City of Lakewood*, 178 N. E. 837.—A zoning ordinance of the city classifying an apartment building for residence purposes is not invalidated as to such property by a change in nearby property from residence property to commercial use.

Aviation

OHIO.—*Swetland v. Curtiss Airports Corporation*, Circuit Court of Appeals, Sixth Circuit, reported in *N. Y. Law Journal* February 8, 1932.

This case, in the lower courts, has been digested in these Notes for August and October, 1930.

In this court the defendants are enjoined from the use of their field on the ground that it is a nuisance to the plaintiffs, on account, not only of low flying, but of noise, glare, etc., necessarily incident to its use.

With regard to the more novel features of the law in this connection, the Court says:

"We first consider the contention that the flying of an aeroplane through the air spaces over plaintiffs' lands is a trespass which, when recurring as a necessary incident to the operation of the air field, must be enjoined. We cannot hold that in every case it is a trespass against the owner of the soil to fly an airplane through the air space overlying the surface. This does not mean that the owner of the surface has no right at all in the air space above his land. He has a dominant right of occupancy for purposes incident to his use and enjoyment of the surface, and there may be such a continuous and permanent use of the lower stratum, which he may reasonably expect to use or occupy himself, as to impose a servitude upon his use and enjoyment of the surface. (See *Portsmouth Co. v. U. S.*, 760 U. S. 327.) As to the upper stratum, which he may not reasonably expect to occupy, he has no right, it seems to us, except to prevent the use of it by others to the extent of an unreasonable interference with his complete enjoyment of the surface."

Zoning in Cleveland and Cincinnati

Cleveland and Cincinnati have issued, in typewritten form, reports with regard to the activities of their Boards of Zoning Appeal during 1931. The Cleveland report contains an excellent analysis of the dangers, during periods of depression, of needless lowering of zoning standards. This passage in the Cleveland report is quoted by Edward M. Bassett in an article to appear in the *City Planning Quarterly* for April, 1932, with further illustration and comment.

The Board of Appeals of New York City

The latest of the many criticisms of the conduct of the Board of Appeals in New York City is contained in the last report of Mr. Seabury with regard to the affairs of that city. Mr. Seabury suggests as a remedy a change in the law; and similar suggestions have been made from time to time in other states. Comments on these suggestions may be found in an article by Edward M. Bassett released January 30 to the press. Stated briefly, his belief is that the law is, in its essentials, sound; and that the remedy is in a more careful selection of the members of such boards.

ZONING DECISIONS, 1931

as reported in The American City are indexed in the 1932 Municipal Index, and supplement the six years' cumulative record in the 1930 Index, and that in the 1931 Index.

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MUNICIPAL AND CIVIC PUBLICATIONS

Prices quoted do not include postage, unless so stated.

Police

Our Lawless Police.—By Ernest Jerome Hopkins. 1931. *xiii + 379 pp. The Viking Press, New York.* $3.00 *from* THE AMERICAN CITY.

Mr. Hopkins, an experienced journalist and investigator, here samples graphically the conditions he found in a coast-to-coast survey of sixteen cities for a sub-committee of the Wickersham Commission, with some reference to the Seabury investigation of magistrates' courts in New York and other sources. The facts presented are, alas, not new. The various police departments show ingenious variety of ways of violating the Bill of Rights, but they all do it. What is more important, fairly reflective police executives admit doing it, and give Mr. Hopkins the impression that the Bill of Rights just won't work any more, in the light of modern crime conditions.

What makes Mr. Hopkins' book particularly valuable, therefore, is his understanding attempt to find out what produces this attitude in the police, and what can be done about it. Of course, these policemen are wrong: and the simplest proof is that whatever form of lawlessness one chief thinks essential, ten other cities are getting along well without. Mr. Hopkins sees, too, that the fault is not all in the police: judges who refuse to make writs of habeas corpus promptly returnable could, by changing their practice, eliminate habitual extra-Constitutional detention. And mayors and citizens' committees who invoke the frontier spirit of vigilantism—"drives" and shooting to kill—cannot complain if young boys are shot to death for petty larceny. It is a far cry from Mayor Walker, urging his police to "give it to them above the waist-line," to Mayor Gaynor, who reminded us that "a policeman is only a citizen in a blue coat with brass buttons."

Mr. Hopkins traces from earlier days the policeman's simple pattern of black and white: the "good citizens" and the crooks, who, because they ar enemies of society, are forsooth not entitled to invoke the Consittution; and he shows how the contact of the police with "good citizens" in the enforcement of traffic ordinances and sumptuary laws during the last years has broken this pattern in confusion.

In his last chapter, "The Question of Remedy," Mr. Hopkins lists twenty-one suggestions—no panaceas, but practical ideas which will help all along the line. He feels that to date civil service in the police field has served more to prevent the dismissal of incompetents than to assure the appointment of high-calibered officers: he sees hope in the public defender, in the city manager movement. He proposes a centralized state police, to give us a Scotland Yard tradition: the history of some of our state constabularies in industrial disputes seems to me to make this hope a little tenuous.

CHARLES S. ASCHER.

Color and Light

The Gates of Light.—By Beatrice Irwin. David MacKay Co., Philadelphia, Pa. 1931. 160 *pp.* $3.00 *from* THE AMERICAN CITY.

Miss Irwin, illuminating engineer, author and lecturer, has subtitled her book "A Record of Progress in the Engineering of Colour and Light." Part I is devoted to Exterior Illumination ("The Arts of Light and Colour"), Part II to Interior Illumination ("Hygiene and Specialization"), and Part III to International Progress and Future Developments. Interspersed with poetic thoughts and quotations, the author makes practical observations based on twelve years' experience as color specialist and illuminating engineer. She has participated in the illumination of a number of exhibits and congresses in this country and abroad.

Year Book

The attractively printed and illustrated 1932 edition of the "League of Virginia Municipalities Year Book" contains a calendar of Virginia government, a calendar and data regarding Virginia courts, and information about Federal, state, county, city and town government, election proceedings, utilities and rates, fire insurance classes, population statistics, the League and other organizations. 222 pp. $6.00. (Apply to the League, Travelers Bldg., Richmond, Va.)

County Road Planning

The National County Roads Planning Commission, in collaboration with the County Highway Officials Division of the American Roadbuilders' Association, has issued a manual of planning based largely upon comprehensive studies made in one rural and one urban county, but supplemented by data from many counties and regions. A pioneer publication of its kind for county engineers and others. 100 multigraphed pp. (Apply to American Road Builders' Association, Washington, D. C.)

Traffic

Vol. 3, Twentieth Annual Safety Congress Transactions (October, 1931) contains an 80-page section on Street and Highway Safety which includes papers and discussions from the joint session with the Institute of Traffic Engineers. (Apply to National Safety Council, 20 N. Wacker Drive, Chicago, Ill., for details of availability.)

Sewerage

In the Report of the Hackensack Valley Sewerage Commission legislation is proposed "for the counties of Bergen and Hudson to act in the capacity of bankers . . . the municipalities reimbursing the counties by paying principal and interest, together with costs of operation, maintenance and repairs on the pay-as-you-go plan, payment to be determined by the unit of million-gallon flow from each municipality." The actual plans for development and construction supported by fact, physical, financial and legal data comprise a thick volume. George W. Fuller and S. Wood McClave, Engineers; Richard C. Smith, Chemist and Bacteriologist. (Apply to the Commission, Tenafly, N. J.)

Regional Planning

The 1931 Report of the Monroe County (N. Y.) Regional Planning Board is a large-size booklet of 29 pages, in stiff covers, illustrated and with insert maps. As a piece of report-making and because of the achievements and undertakings reported upon, it will be of interest to planners and librarians to whom it is available. (Apply to the Board, Terminal Bldg., Rochester, N. Y.)

Water Supply

"The Hetchy Hetchy Water Supply and Power Project" is the title of a 64-page booklet by M. M. O'Shaughnessy, M.A.S.C.E., City Engineer of San Francisco, issued as the Public Utilities Commission created under the city's new charter assumes control of this monumental development. (Apply to the author.)

Street Paving

"Paving of Streets by Property Owners or Real Estate Developers at Their Own Cost and Expense with Their Own Contractors" is a 21-page mimeographed report issued by the Bureau of Municipal Affairs of the Pennsylvania Department of Internal Affairs. The report summarizes the replies received from cities of the third class in response to a request for copies of any ordinance they might have adopted pertaining to the paving of streets by property owners, or information as to other means and methods which they had devised or might devise to regulate such a situation. (Apply to Hon. Philip H. Dewey, Sec., Dept. of Internal Affairs, Harrisburg, Pa.)

Benefit Assessments

A detailed study of the specific application of the principle of benefit assessments in a particular city has been made by George Adams Graham, as Nos. 3 and 4, Volume XVII, of the University of Illinois Studies in the Social Sciences. It is entitled "Special Assessments in Detroit." The definite projects covered include street widening, opening and paving. The author discusses the subject in general, but his chief endeavor is to present the details of actual instances where benefit assessments have been applied. 318 pp. $2.50. (Apply to University of Illinois Press, Urbana, Ill.)

Housing

The final publication of the 1931 Congress of the International Housing Association combines Publications VI and VII and is published in an issue of the Association's review, *Housing and Construction* (Vol. III, No. 5/6. Price, 4 marks). The volume contains a detailed report of the members' meeting and of the discussion on the following themes: (1) the social importance of housing now and in the future; (2) the building of small dwellings with reasonable rents; and (3) inspection of dwellings (custody and care). The other reports are as follows:

Publication I—Preliminary information about the Congress. (Vol. III, No. 1/2, *Housing and Construction.*) 88 pp. 4 marks.

II—"The Social Importance of Housing Now and in the Future." 553 pp. 8 marks.

III—"Public Utility and Private Housing Activity," by Senator Dr. F. M. Wibaut, Amsterdam, Holland. (Vol. III, No. 3, *Housing and Construction.*) 68 pp. 3 marks.

IV—"The Building of Small Dwellings at Reasonable Rents," by Professor Franz Schuster, Architect. 132 pp. 6 marks.

V—"Inspection of Dwellings" (Custody and Care), by Dr. Marie-Elisabeth Luders, Berlin. (Vol. III, No. 4, *Housing and Construction.*) 29 pp. 3 marks.

The complete set of publications may be obtained for 20 marks; bought separately, the total cost is 28 marks. A reduction of 25 per cent is allowed for payments made in advance for either the individual reports or for the complete set. (Apply to Dr. Hans Kampffmeyer, General Secretary, International Housing Association, Frankfort o/M., Hansa-Allee 27, Germany.)

Water Works

A 9-page pamphlet is devoted to "An Epitome of the Report on the Engineering Design and Construction of the East Jefferson Water Works, Purification and Fire Defense System" in District Number One, Jefferson Parish, La. (Apply to Hendy A. Mentz & Co., Hammond, La.)

Utility Accounting

"An Outline of Suggested Forms for Minnesota Municipal Plants" is the subtitle of the League of Minnesota Municipalities' Publication No. 34, "Municipal Utility Accounting," by Roy L. Reierson, of the Institute of Land Economics and Public Utilities, Northwestern University. 12 pp. 15c. (Apply to the League, 15 University of Minnesota Library, Minneapolis, Minn.)

Work Relief

A section of a book on "Emergency Work Relief," shortly to be issued by the Russell Sage Foundation, has been brought out as a separate pamphlet because of the pressing need for information in the field of work relief. "Setting Up a Program of Work Relief," by Joanna C. Colcord, Director, Charity Organization Department, Russell Sage Foundation, is a guidance report pointing out the difficulties to be met with and methods which have had some success. 23 pp. 25c. (Apply to the Foundation, 130 E. 22d St., New York.)

Tax Rates

Published for the information of local officials in Kansas, the "1931 Tax Rate Book" of the League of Kansas Municipalities (Bulletin No. 93) is "a compilation of the city, city school and county tax rates effective for 578 cities and 105 counties in Kansas, together with the population, assessed valuations, bonded indebtedness, and outstanding registered warrants." 50 pp. $1.00 (3 copies for $2.50). (Apply to the League, Lawrence, Kans.)

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Community Music

Music in American Life, Present and Future.—Prepared for the National Recreation Association by Augustus Delafield Zanzig. Foreword by Daniel Gregory Mason. Oxford University Press, New York. 1932. VIII + 560 *pp. Illustrated.* $3.50 *from* THE AMERICAN CITY.

The telling of what is being done by community groups in various forms of musical activity as studied by Mr. Zanzig throughout the United States is very stimulating. It is a human survey, sympathetically, critically, and constructively presented. The amateur musical undertakings of our country are analyzed, with the purpose of vitalizing individual initiative in homes, schools, playgrounds, camps, etc., to know the joys of creating music rather than passively accepting professional, specialized presentations. The first chapter tells of the distinguished musical accomplishments of Flint, Mich., in the schools and through the Community Music Association, by churches, clubs, foreign-born and industrial groups, in choruses, bands, and the Symphony Orchestra, and elsewhere in the book we learn in detail how these things were brought about. The chapters showing what music does for people, and "What People Do to Music and Where and When," also the one dealing with common obstacles to the development of community music, are especially effective in leading the reader on to find out from the author just how it is possible to start this work in different types of organization for the whole community and in various centers in the community life; how to secure leadership; what the costs will be; how aid can be secured. The volume offers an ideal and a working guide towards its achievement. The explanations and instructions are practical and full of detail. A new prosperity is envisaged, based on the development of human resources.

Street Lighting

"Saving Social Waste by Better Street Lighting" is the title of a paper by Thomas W. Rolph, managing engineer of the Holophane Co.'s street-lighting department, published in the October, 1931, *Transactions* of the Illuminating Engineering Society, and now reprinted. It estimates the huge social saving possible by reducing traffic accidents and crime, through adequate street lighting, and recounts principles and methods to be considered. 22 pp. (Apply to Street Lighting Dept., Holophane Co., Inc., Newark, Ohio.)

Unemployment

Under the title, "Employment Trends in St. Paul, Minneapolis and Duluth," the Employment Stabilization Research Institute, University of Minnesota, presents the first of a series of bulletins covering unemployment data concerning the three major cities of Minnesota for the years 1925 to 1930 inclusive. This study is by William H. Stead, Secretary of the Institute and Assistant Professor of Economics in the University of Minnesota, and Dreng Bjornaraa, Research Assistant. A wealth of detailed statistics for a large number of occupations is given, much of which is strikingly illustrated by graphs. A brief supplement covering 1931 figures is to follow. 130 pp. $1.00. (Apply to University of Minnesota Press, Minneapolis, Minn.)

Water Pollution

Water Pollution is the subject of the January issue of the Summary of Current Literature, issued monthly by the Department of Scientific and Industrial Research of Great Britain. It contains digests of numerous American articles and papers, among others. 36 pp. 2s. net. (Address: 16 Old Queen Street, London, S.W.1, England.)

Column Tests

The first and second progress reports from Lehigh University on concrete column tests sponsored by the American Concrete Institute are published as Lehigh University Publication No. 10. The authors, Slater and Lyse, had charge of the tests at the University. 100 pp. 50c. (Apply to Lehigh University, Bethlehem, Pa.)

Planning and Zoning

Papers from the 1931 meeting of the Westchester County Planning Federation, now available in a 50-page booklet, include several distinctive contributions to the planning subject, made both by officials from communities of the county and by experts invited to the meeting. The making and administration of plans, zoning, subdivision regulation, "zoning" gas stations, and parking problems, are among the topics. (Apply to the Federation, White Plains, N. Y.)

Municipal Courts

Because little has yet been done to improve our lowest courts, in which the large part of the judicial business in a state is transacted, the Michigan Municipal League has published "Municipal Courts in Michigan," by W. Rolland Maddox (Bulletin R-2), "a study of the powers of (Michigan) cities, features of organization, finance, and other questions in connection with those local courts which have broken away to some degree from the old statutory fee-paid justice of the peace system. The material has been obtained from an intensive study of charter and statutory provisions, from replies to requests for financial and organization data, and from personal visits to the municipal courts of a number of cities." 41 pp., mimeographed. $1.00. (Apply to the League, Ann Arbor, Mich.)

Suburban Land Values

"The Valuation of Vacant Land in Suburban Areas, Chicago" is the title of the most recent addition to the group of studies on effective land utilization in that region, being carried on by the Institute for Economic Research, Northwestern University. It is by Herbert D. Simpson and John E. Burton, and is edited by Richard T. Ely. A method, capable of general application, is developed for estimating the "thickness of the stratum of urban land values" overlying the usual agricultural and vacant land values. This method is applied specifically to the facts obtaining within the area, and a series of value "levels" are realized which the authors in turn compare with present actual assessment, with resulting wide discrepancies. Assessors are not merely nor mainly responsible; "vicious merchandising practices" are shown to have ruled in subdivision methods throughout the area. There is a final chapter of "Implications and Conclusions." 56 pp. $1.00. (Apply to Northwestern University, Chicago, Ill.)

Shade Trees

The Bureau of Municipal Affairs of the Pennsylvania Department of Internal Affairs has published a mimeographed bulletin on "The Establishment, Organization and Functions of Shade Tree Commissions in the Commonwealth of Pennsylvania," which contains a brief digest of the law applicable to some 960 boroughs in Pennsylvania and a program for obtaining a shade tree commission and organizing its work. 9 pp. (Apply to Hon. Philip H. Dewey, Sec., Dept. of Internal Affairs, Harrisburg, Pa.)

City Data

The edition covering the year 1930 of "Comparative Statistics—Cities of Ohio" has recently been issued by the Ohio Bureau of Inspection and Supervision of Public Offices. The statistics are all financial and are separated into the following general divisions: I, Receipts; II, Expenditures; III, Debt; IV, Memorandum, including total salaries and wages and tax levies. 113 pp. (Apply to Joseph T. Tracy, Auditor of State, Columbus, Ohio.)

Proceedings

The twenty-third annual convention of the League of Kansas Municipalities, held in October, 1931, is reported in the 1932 annual number (January) of *Kansas Municipalities*, where they take up 144 pages of the issue, including many interesting addresses and discussions. This number also includes the Kansas Tax Rate Book for 1931, occupying 40 pages. $1.00. (Apply to the League, Lawrence, Kans.)

Electric Power

A wide variety of able writers and speakers was assembled by the American Academy of Political and Social Science for its meeting, late in 1931, reported under the heading "Power and the Public," as the January, 1932, issue of *The Annals*. This number is edited by Ernest Minor Patterson, Ph. D., President of the Academy and Professor of Economics at the University of Pennsylvania. Eminent representatives of the power companies, regulating authorities, and the general public took part. The contents of the volume are grouped under the topics of the holding company, rates, regulation (Federal and state), valuation, public versus private ownership, and our electrical future. 190 pp. $2.00. (Apply to the Academy, 3457 Walnut St., Philadelphia, Pa.)

Regional Police

A report on the possibilities of cooperation between existing police agencies in the Cincinnati metropolitan area, entitled "A Regional Police Plan for Cincinnati and Its Environs," has been prepared by Bruce Smith, of the Institute of Public Administration, for the Cincinnati Regional Crime Committee. See pages 93 and 94 of this issue. 24 pp. 50c. (Apply to the Institute of Public Administration, 261 Broadway, New York.)

Weights and Measures

The "Report of the Twenty-Fourth National Conference on Weights and Measures," held at the Bureau of Standards in Washington, D. C., in June, 1931, and attended by representatives from various states, is published in a 182-page pamphlet. 50c. (Apply to the Superintendent of Documents, Washington, D. C.)

Blighted Districts

A special multigraphed bulletin on "What Blighted Districts Mean in Our Communities," by William L. Pollard, member of the Civic Development and Real Estate Committee of the Los Angeles Chamber of Commerce, has been issued by the Civic Development Department of the Chamber. 4 pp. (Apply to the Department, Los Angeles Chamber of Commerce, 1454 S. Broadway, Los Angeles, Calif.)

A County's Finances

The Bureau of Governmental Research of Kansas City, Kans., makes a "Report on the Examination of the Finances and Financial Records of Wyandotte County," the latter being the county in which Kansas City, Kans., is situated. December 21, 1931. 19 pp., mimeographed. (Apply to the Bureau, 727 Minnesota Ave., Kansas City, Kans.)

Mosquito Control

An address on "Mosquito Control," by Edward Wright, Sanitary Engineer, Massachusetts Department of Public Health, and Chairman of the State Reclamation Board, delivered at a meeting of the Sanitary Section of the Boston Society of Civil Engineers last spring, together with the discussion which followed, occupies 21 pages in the November number of the Society's *Journal*. 50c a copy. (Apply to the Society, 715 Tremont Temple, Boston, Mass.)

Village Budgets

"Trend of Village Budgets," Information Bulletin No. 8 of the Michigan Municipal League, has been based on information received from 152 Michigan villages in reply to a questionnaire sent to all villages in the state during the past summer requesting information about the assessed valuation, the amount of revenue raised from taxes, the amount of miscellaneous revenue, and the total for each of the years 1929, 1930 and 1931. 13 pp. $1.00. (Apply to the League, Ann Arbor, Mich.)

Tax Control

Dr. Wylie Kilpatrick, Associate Editor of *New Jersey Municipalities*, is the author of two articles on "Tax and Expenditure Control," in that magazine. In December appeared "Is the Indiana Plan the Way Out?", followed in January by "Local Community Review of Finances." They have been reprinted. See p. 73. (Apply to the author, N. J. State League of Municipalities, 34 W. State St., Trenton, N. J.)

Other Reports Received

CINCINNATI, OHIO.—Annual Report of City Auditor, 1931. 10 pp.

HARTFORD, CONN.—Annual Report, Engineering Department, to March 31, 1931. 55 pp.

KENOSHA, WIS.—Annual Report, Director Public Works, 1931. 36 pp., and charts.

PROVIDENCE, R. I.—Annual Reports, City Plan Commission, 1929-1931. 44 pp.

ST. PAUL, MINN.—Annual Report, Commissioner of Public Works. 1930. (A document of permanent value on city finances.) 50 pp.

TRENTON, N. J.—Annual Report, City Comptroller. 1930. 90 pp.

WAYNE COUNTY, MICH.—Annual Report, Board of County Road Commissioners. 1931. 130 pp.

WILMINGTON, DEL.—Annual Report, Superintendent of Public Safety, to July, 1931.

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CONVENTIONS—WHEN AND WHERE

(Figures in parentheses following the name of the convention city indicate the estimated attendance, other than local.)

MARCH 9-11.—NIAGARA FALLS, ONT. (160)
American Water Works Association—Canadian Section. Annual meeting. Secretary-Treasurer, Dr. A. E. Berry, Director of Sanitary Engineering, Province of Ontario, Parliament Buildings, Toronto 5, Ont.

MARCH 9-10.—LAFAYETTE, IND.
American Water Works Association—Indiana Section. Annual meeting. Secretary-Treasurer, C. K. Calvert, 1902 North Jersey Street, Indianapolis, Ind.

MARCH 10.—CONCORD, N. H. (150)
New Hampshire Good Roads Association. Annual meeting. Secretary, Frank D. Sleeper, Laconia, N. H.

MARCH 16-18.—ST. PETERSBURG, FLA. (120)
American Water Works Association—Florida Section. Annual meeting. Secretary, Louva G. Lenert, Chief Engineer, State Board of Health, Jacksonville, Fla.

MARCH 17-18.—TRENTON, N. J.
New Jersey Sewage Works Association. Annual meeting. Secretary, John R. Downes, Bound Brook, N. J.

MARCH 22-24.—ATLANTA, GA. (200)
American Water Works Association—Southeastern Section. Annual meeting. Secretary-Treasurer, W. H. Weir, 4 Capitol Square, S. W., Atlanta, Ga.

MARCH 30.—WHITE PLAINS, N. Y.
Westchester County Planning Federation. Semi-annual conference. Secretary, Wells F. Wise, Chamber of Commerce, 201 Main Street, White Plains, N. Y.

APRIL 1-2.—LIVINGSTON, MONT. (50)
American Water Works Association—Montana Section. Annual meeting. Secretary, Herbert B. Foote, State Board of Health, Helena, Mont.

APRIL 7-8.—SYRACUSE, N. Y. (150)
American Water Works Association—New York Section. Spring meeting. Secretary, E. D. Case, The Pitometer Co., 50 Church Street, New York.

APRIL 8.—SMITHFIELD, N. C. (500)
Eastern Carolina Chamber of Commerce. Annual meeting. Secretary, N. G. Bartlett, Kinston, N. C.

APRIL 11-14.—WASHINGTON, D. C. (1,300)
American Red Cross. Annual convention. Secretary, Mabel T. Boardman, National Headquarters, Washington, D. C.

APRIL 11.—NEW YORK. (500)
National Committee on Prisons and Prison Labor. Annual meeting. Secretary, Julia K. Jaffray, 250 West 57th Street, New York.

APRIL 11-15.—STILLWATER, OKLA.
Oklahoma Water and Sewage Conference. Secretary-Treasurer, H. J. Darcy, State Sanitary Engineer, Oklahoma City, Okla.

APRIL 12-13.—URBANA, ILL. (100)
American Water Works Association—Illinois Section. Annual convention. Secretary, Professor J. J. Doland, University of Illinois, Urbana, Ill.

APRIL 12-13.—CUMBERLAND, MD. (125)
Maryland-Delaware Water and Sewerage Association. Annual conference. Secretary, A. W. Blohm, 2411 North Charles Street, Baltimore, Md.

APRIL 14-16.—JACKSONVILLE, FLA. (100)
Florida Engineering Society. Annual meeting. Secretary, W. W. Fineren, Gainesville, Fla.

APRIL 15-16.—PHILADELPHIA, PA. (250)
American Academy of Political and Social Science. Annual meeting. Secretary, J. P. Lichtenberger, 3457 Walnut Street, West Philadelphia, Pa.

APRIL 17-19.—LUFKIN, TEXAS. (5,000)
East Texas Chamber of Commerce. Annual convention. General Manager, Hubert H. Harrison, Longview, Texas.

APRIL 20-21.—BOSTON, MASS.
Massachusetts Safety Conference. Secretary, Lewis E. MacBrayne, 6 Beacon Street, Boston, Mass.

APRIL 22-23.—MACON, GA. (100)
Southern Commercial Secretaries' Association. Annual meeting. Secretary-Treasurer, Karl Lehman, Orange County Chamber of Commerce, Orlando, Fla.

APRIL 25-29.—DETROIT, MICH. (600)
National League of Women Voters. Biennial convention. Executive Secretary, Beatrice H. Marsh, 532 17th Street, N. W., Washington, D. C.

APRIL 25.—BOSTON, MASS. (90)
New England Sewage Works Association. Annual meeting. Secretary, F. W. Gilcreas, 14 Beacon Street, Boston, Mass.

APRIL 27-29.—WASHINGTON, D. C. (200)
American Institute of Architects. Annual convention. Secretary, Frank C. Baldwin, The Octagon, Washington, D. C.

MAY 2-6.—MEMPHIS, TENN. (1,500)
American Water Works Association. Annual convention. Secretary, Beekman C. Little, 29 West 39th Street, New York.

MAY 4-7.—VIRGINIA BEACH, VA. (200)
National Conference on State Parks. Annual meeting. Executive Secretary, Herbert Evison, 905 Union Trust Building, Washington, D. C.

MAY 7.—PARIS, FRANCE. (150)
Association of Garden Cities of France. International Association of Lineal Cities. Annual meeting. Director, Georges Benoit-Lévy, "L'Etoile," 25 Rue Rennequin, Pessicart, Nice, France.

MAY 9-11.—SAN ANTONIO, TEXAS.
City Marshals and Chiefs of Police Union of Texas. Annual convention. Secretary, George A. Smith, P. O. Box 299, Dallas, Texas.

MAY 9-12.—ATLANTIC CITY, N. J.
National Fire Protection Association. Annual meeting. Managing Director, Franklin H. Wentworth, 60 Batterymarch Street, Boston, Mass.

MAY 12-13.—WASHINGTON, D. C.
American Road Builders' Association. Annual meeting. Engineer-Director, Charles M. Upham, 938 National Press Building, Washington, D. C.

MAY 12-14.—WENATCHEE, WASH. (115)
American Water Works Association—Pacific Northwest Section. Annual meeting. Secretary, Ernest C. Willard, 720 Corbett Building, Portland, Wash.

MAY 12-14.—SWEETWATER, TEXAS.
West Texas Chamber of Commerce. Annual convention. Manager, D. A. Bandeen, Stamford, Texas.

MAY 15-21.—PHILADELPHIA, PA.
National Conference of Social Work. General Secretary, Howard R. Knight, 82 North High Street, Columbus, Ohio.

MAY 16-20.—SAN FRANCISCO, CALIF. (3,000)
Chamber of Commerce of the United States of America. Annual meeting. Secretary, D. A. Skinner, 1615 H Street, N. W., Washington, D. C.

MAY 16-17.—SAN FRANCISCO, CALIF.
Western School for Commercial Secretaries. Annual session. Manager, Leonard E. Read, Chamber of Commerce Building, Seattle, Wash.

MAY 23, WEEK OF.—LONDON, ENGLAND.
International Congress of Local Authorities. (Followed by tours in England and Scotland during the next two weeks.) General Secretary, E. Vinck, Rue de la Régence, Brussels, Belgium; General Secretary of the British Organization, G. Montagu Harris, Ministry of Health, Whitehall, London, S. W. I., England. American inquiries may be addressed to Luther Gulick, Director, National Institute of Public Administration, 261 Broadway, New York.

MAY 24-27.—LOS ANGELES, CALIF. (200)
National Association of Public School Business Officials. Annual meeting. Secretary, John S. Mount, Inspector of Accounts, State Department of Public Instruction, Trenton, N. J.

MAY 25-27.—MENASHA, WIS.
League of Wisconsin Municipalities. Annual convention. Secretary, Frederick MacMillin, 114 North Carroll Street, Madison, Wis.

MAY 26.—NEW YORK.
National Board of Fire Underwriters. Annual meeting. General Manager, W. E. Mallalieu, 85 John Street, New York.

JUNE 2-3.—WASHINGTON, D. C.
Conference of State and Provincial Health Authorities of North America. Secretary, Dr. A. J. Chesley, State Board of Health, St. Paul, Minn.

JUNE 3-4.—CHAMBERSBURG, PA. (50)
Pennsylvania Commercial Secretaries' Association. Annual meeting. Secretary-Treasurer, Patrick Flood, 5921 Pennsylvania Avenue, Pittsburgh, Pa.

JUNE 4-6.—WASHINGTON, D. C.
Conference of State and Territorial Health Officers with the United States Public Health Service. Address: Surgeon General, U. S. Public Health Service, Treasury Department, Washington, D. C.

JUNE 13-16.—LOS ANGELES, CALIF.
National Conference on City Planning. Secretary, Flavel Shurtleff, 130 East 22d Street, New York.

JUNE 14-16.—PORTLAND, ORE. (500)
International Association of Chiefs of Police. Annual convention. Secretary, George Black, Chief of Police, Wilmington, Del.

JUNE 20-24.—CLEVELAND, OHIO. (550)
American Institute of Electrical Engineers. Annual summer convention. Asst. Nat'l Sec., H. H. Henline, 33 West 39th Street, New York.

JUNE 20-24.—ATLANTIC CITY, N. J.
American Society for Testing Materials. Annual meeting. Secretary-Treasurer, C. L. Warwick, 1315 Spruce Street, Philadelphia, Pa.

JUNE 27—JULY 1.—LAKE OF BAYS, ONT. (500)
American Society of Mechanical Engineers. Semi-annual meeting. Secretary, C. W. Rice, 29 West 39th Street, New York.

JUNE 27, WEEK OF.—CINCINNATI, OHIO.
National Association of Real Estate Boards. Annual convention. Executive Secretary, Herbert U. Nelson, 59 East Van Buren Street, Chicago, Ill.

JULY 23-29.—LOS ANGELES, CALIF.
International Recreation Congress and annual meeting of the National Recreation Association. First International Congress. Administrative Secretary, Thomas E. Rivers, 315 Fourth Avenue, New York.

SEPTEMBER 19-21.—WASHINGTON, D. C.
American Civic Association, Inc. National Municipal League. Joint meeting. Secretary of the Association, Miss Harlean James, 901 Union Trust Building, Washington, D. C. Secretary of the League, Russell Forbes, 261 Broadway, New York.

SEPTEMBER 26, WEEK OF.—SWAMPSCOTT, MASS.
Illuminating Engineering Society. Annual convention. General Secretary, E. H. Hobbie, 29 West 39th Street, New York.

SEPTEMBER 29-OCTOBER 1.—PITTSBURGH, PA.
International Association of Public Works Officials. Annual convention. Secretary, A. M. Anderson, 100 North LaSalle Street, Chicago, Ill.

OCTOBER 3-7.—WASHINGTON, D. C. (5,000)
National Safety Council. Annual congress. Managing Director, W. H. Cameron, 20 North Wacker Drive, Chicago, Ill.

OCTOBER 23-26.—MEMPHIS, TENN.
National Association of Commercial Organization Secretaries. Annual convention. Secretary-Treasurer, J. H. Holt, Manager, Association of Commerce, Fort Worth, Texas.

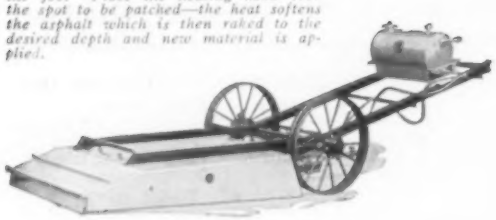
OCTOBER 24-27.—WASHINGTON, D. C.
American Public Health Association. Annual meeting. Acting Executive Secretary, Dr. Kendall Emerson, 450 Seventh Avenue, New York.

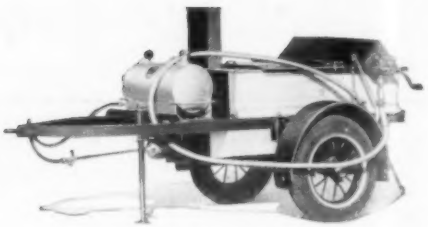
OCTOBER 31—NOVEMBER 2.—WINSTON-SALEM, D. C.
American Water Works Association—North Carolina Section. Annual meeting. Secretary, Professor H. G. Baity, Department of Sanitary and Municipal Engineering, University of North Carolina, Chapel Hill, N. C.

NOVEMBER 7-11.—NEW ORLEANS, LA.
American Society of Municipal Engineers. Annual convention. Secretary, C. W. S. Sammelman, 4359 Lindell Boulevard, St. Louis, Mo.

NOVEMBER 14-18.—WASHINGTON, D. C.
American Association of State Highway Officials. Annual convention. Executive Secretary, W. C. Markham, 1222 National Press Building, Washington, D. C.

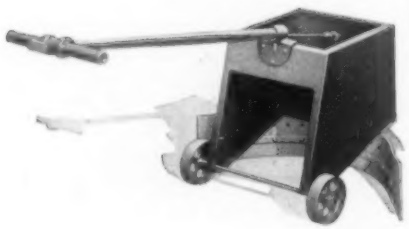
Repairing of sheet asphalt and bituminous macadam surfaces is speeded up when the LB Surface Heater is put on the job. Place the heating hood over the spot to be patched—the heat softens the asphalt which is then raked to the desired depth and new material is applied.





Here is an ideal outfit for penetration patch work and skin patching. It is our No. 84-HD oil burning Tar and Asphalt Kettle, equipped with Hand Spray Attachment. No. 84-HD is one of a complete line of LB kettles ranging in size from 10 to 1500 gallons.

At right: The HaulDeeBox protects your tools and equipment. This all-steel portable tool box made a tremendous hit at the Detroit A. R. B. A. Road Show. Let us show you how one lock fastens the double covers full length of the box. Write for complete information.



At left is the Squeegee Cart, a small outfit that is a big help on any surfacing job. It applies filler on brick, granite and wood block surfaces. Many highway departments use it to apply seal coat to asphalt and concrete surfaces. Write for a complete description and price.

If you use emulsions, you will certainly be interested in the outfit at the right. It is our standard No. 93-AM Emulsion Distributor. The 75-gallon tank is airtight and the outfit operates under 40 pounds pressure. Hose and spray bar are furnished. Write for complete information.

COOPERATION *is Responsible for the* ACCEPTANCE *of* LITTLEFORD EQUIPMENT

To pioneer in the manufacture of maintenance equipment, it is necessary to keep posted on new methods used by highway departments and contractors.

Ever since 1900, when the first Littleford tar kettle was built, Littleford Bros. have kept a watchful eye on highway maintenance problems. By close contact with highway men, it has been possible to develop the Littleford line of road maintenance equipment until, at the present time, it includes thirty-three products.

There is Littleford equipment of some kind or another in use in every state in the Union and in many foreign countries. This great acceptance is due to performance of equipment planned to do a job and to do it well.

During this time of curtailed budgets, you want complete data on all the equipment you need. A letter from you will bring complete information about our entire line. You will be under no obligation. Now is the time to write.

LITTLEFORD

Road Maintenance Equipment

SINCE 1900

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THE SIGN OF A GOOD HEATER — LB — LITTLEFORD BROS. CINCINNATI, OHIO

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NEWS AND ILLUSTRATIONS

Items of Interest to City, Town and County Officials, and Others Concerned with the Economical Construction and Efficient Operation of Public Improvement Undertakings

Carrier-Current Control for Street Lights

Superimposing one electric current upon another, the General Electric Co., Schenectady, N. Y., has developed a method of controlling the operation of street lights by making use of the same service wires that supply the lighting current. The wire actually possesses the ability to transmit simultaneously three or more electric currents of different characteristics. These currents do not interfere with each other.

In the new control for street lights and off-peak loads, only two currents are transmitted simultaneously. They are the regular continuous supply current for light and power and one of the control or carrier currents. These have much higher electric frequencies than the service current, which usually is 60-cycle alternating current. The control currents for the street lights are 480 cycles, which passes over the wire for very brief periods, only long enough to actuate the control devices, but there is no reason why such currents cannot flow steadily if required. Already the control system is in use in Springfield, Mass., controlling 800 street lights without the necessity of using a separate current for the control mechanism, hence making possible a pronounced saving. The double-control method, employing currents of two frequencies, is already so practical that it is suitable for general commercial utility purposes.

In the operation of the carrier-current system a motor-alternator at the distribution sub-station feeds carrier-current of 480 or 720 cycles into the primary feeders. This superimposed control energy travels along the feeders and is then stepped down to the 115-volt secondary circuits by the distribution transformers in essentially the same manner as the 60-cycle power voltage. At desired points along the 115-volt secondary circuit, tuned relays respond directly to the carrier current. On a carrier impulse of approximately 10 seconds, the load contactors controlled by these tuned relays close the load circuit and open them on an impulse of approximately 35 seconds. Operation can be effected simply by pressing an on-and-off push-button at the distribution sub-station. When it is desired to open or close a group of loads, the proper button is pressed, causing the motor alternator to start. After sufficient time has elapsed to assure normal speed of the motor, the high-frequency voltage is impressed upon the feeder circuits for the proper time interval, after which the equipment automatically shuts down. For average sub-station areas, the output requirements of the transmitter equipment range from 1 to 25 kva. The transmitter and the control equipment can be arranged to energize successively each phase of the sub-station feeder bus, or in the case of primary street-lighting control, all controllers can be placed on the same phase of the 115-volt secondaries and thus permit a simplification of the transmitter control apparatus.

Drop-Frame Semi-Trailers for Refuse Collection

A new drop-frame side-dump semi-trailer, especially adapted for ash, garbage, rubbish, street sweepings and other municipal collection activities, has recently been announced by the Highway Trailer Co., Edgerton, Wis. This unit comes equipped with a sliding canvas cover which keeps all of the garbage and rubbish from public view. It insures a maximum loading space and prevents waste from being blown over the streets during collection. It is possible with this semi-trailer to make a complete turn in a 30-foot street, and it can be turned in a 12-foot alley without much effort. The trailer can be quickly detached from the truck and is furnished in 4½- to 8-cubic-yard water-level bodies.

Owing to the fact that only 40 per cent of the load is carried on the truck, and 60 per cent is handled by the trailer, this piece of equipment enables any truck operator to convert a 1½-ton truck into a 3- to 4-ton unit. A few months ago fourteen of these semi-trailers were installed in the city of Cincinnati, Ohio, and they are being operated in connection with 62 Highway 4-wheel drop-frame, side-dump trailers. A contract was recently awarded to the Highway Trailer Co. for twelve of these units to be delivered to the city of Peoria, Ill. The accompanying illustration shows one of the 4½-cubic-yard water - level 8 cubic yards crowned capacity semi-trailers installed in the city of East Chicago, Ind.

Miller to Manage Pacific Division of Asphalt Institute

The Asphalt Institute, 801 Second Avenue, New York, through the Managing Committee of the Pacific Coast Division, has announced the appointment of Daniel B. Miller as Managing Engineer. Western offices of The Asphalt Institute have been opened by Mr. Miller at 206 Sansome Street, San Francisco. Mr. Miller was formerly Chief Engineer of Maintenance for the Wyoming State Highway Department. New Pacific Coast members of The Asphalt Institute are the Standard Oil Co. of California, Union Oil Co. of California, Shell Oil Co., Associated Oil Co., and Gilmore Oil Co., Ltd.

Union Metal Adds Line of Concrete Lighting Standards

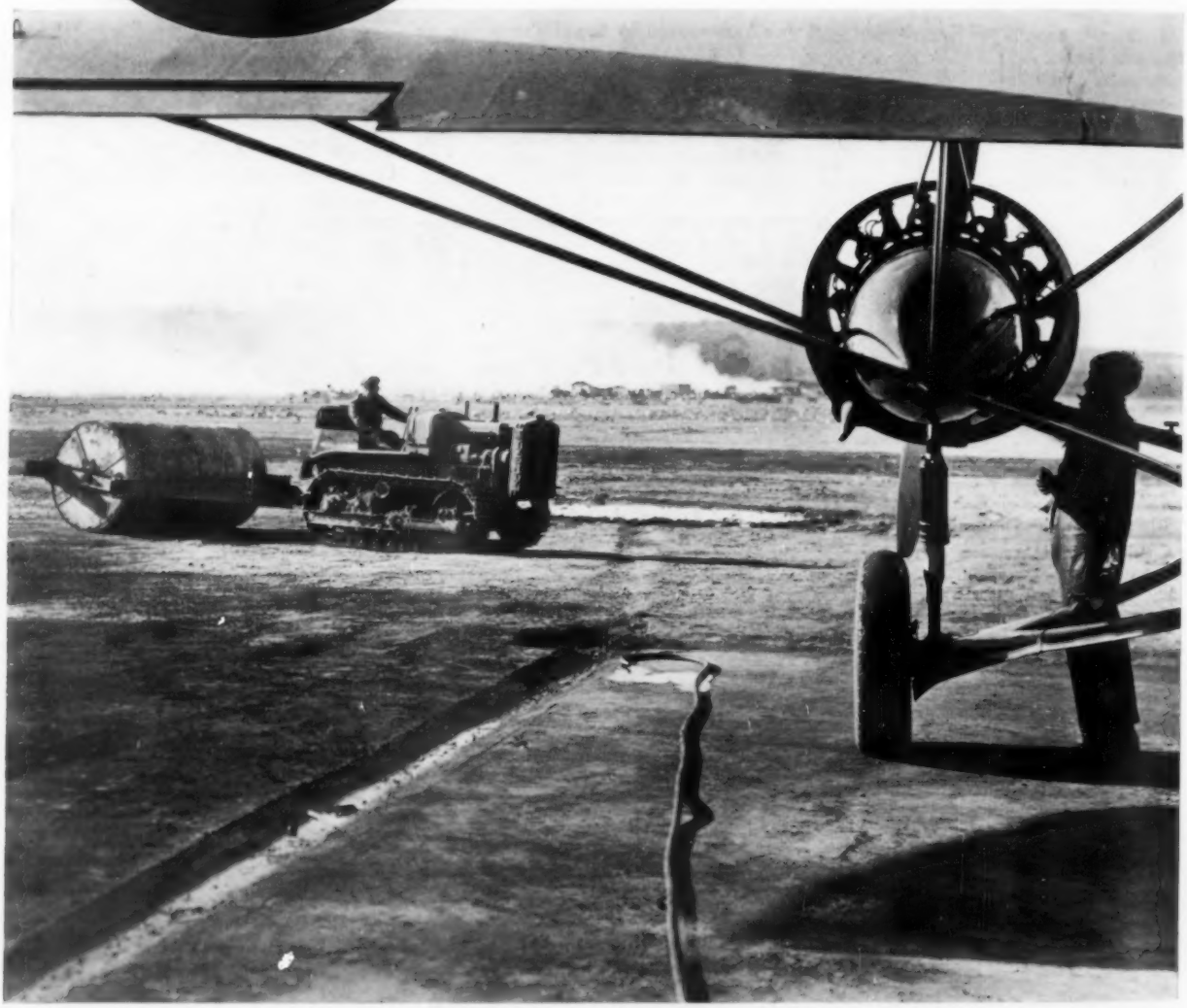
Recently The Union Metal Manufacturing Co., Canton, Ohio, became the exclusive selling agency for the concrete lighting standards and other products manufactured by The American Concrete Marbelite Co., of Chicago, Ill. This addition to the Union Metal Steel and King Ferronite cast iron standards presents a very complete line of street-lighting standards sold by one organization. Distribution of these products will be handled through the medium of The Union Metal Manufacturing Co. national agencies, the Graybar Electric Co., Inc., and the General Electric Supply Corporation.

The new concrete lighting standard will be marketed under the name of "Spun-Crete." The production facilities allow the customer the choice of either the "Vibro-Jolted" or "Centrifugally-Spun" method of manufacture. Both processes utilize first-quality cement, together with a graded crushed granite aggregate.

ONE OF THE EAST CHICAGO, IND., SEMI-TRAILERS WITH THE CANVAS COVERS PULLED BACK TO SHOW THE ENTIRE LOAD

KEPT BRISKLY BUSY

PULLING a concrete roller, a "Caterpillar" Tractor smooths the landing field at Washington-Hoover Airport, South Washington, D. C. Larger-size "Caterpillars" do the heavy construction work—smaller sizes park the planes. For the earth-moving jobs of initial construction or later expansion, for the constant tasks of maintenance and hangar and shop service, for a hundred and one duties around every airport—"Caterpillar" Tractors offer versatile, dependable power.



Caterpillar Tractor Co., Peoria, Illinois, U. S. A.
Track-type Tractors Combines Road Machinery
(There's a "Caterpillar" Dealer Near You)

Prices—f. o. b. Peoria, Illinois

FIFTEEN	$1100	THIRTY-FIVE	$2400
TWENTY	$1450	FIFTY	$3675
TWENTY-FIVE	$1900	SIXTY-FIVE	$4350
DIESEL	$6500		

CATERPILLAR

REG. U. S. PAT. OFF.

TRACTOR

When you write for that catalog, kindly mention THE AMERICAN CITY

Caterpillar's Special Sales Division Staff

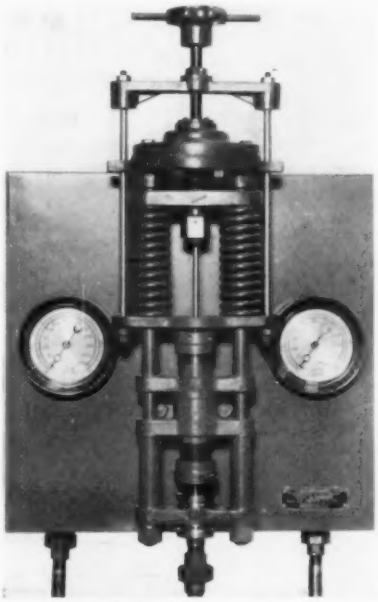
The Caterpillar Tractor Co., Peoria, Ill., has given the name of Special Sales Division to the group of sales engineers who are contacting the larger buyers, a work similar to that of the "fleet sales division" of the larger automotive manufacturers. W. J. Dukes is Manager of Engine Sales. G. W. A. Bell, Jr., C. D. Turley, J. H. Howell, Manager of Sales to Public Utilities, and Harold G. Tufty complete the staff working under Walter H. Gardner.

A Mechanical Chip Spreader with Agitator

A mechanical chip spreader with a road wheel which operates a spiral agitator running across the body of the unit, and which may be attached to a motor truck in one minute, has been placed on the market by the Adnun Engineering & Manufacturing Co., Nunda, N. Y. The Adnun N & H mechanical spreader consists of a steel trough which is suspended below the tail gate of the truck and receives material from the truck as the body is raised. A rubber-tired wheel at one end of the spreader serves to keep the material agitated by a spiral rod so that an even, constant flow of the material is delivered to the road. Attaching the spreader to the truck is merely a matter of hooking on two ratchet locks and brake wenches, connected by a plow-steel cable. The spreader will supplant the hand labor of from 15 to 20 men and will give a more even spread over the road surface.

The spreader is equally effective whether the truck is moving foward or in reverse. Adjustment for change in direction is easily made by simply throwing an auxiliary lever. The weight of the spreader is carried by the truck. The width of the spreader is adjustable from 6 inches to 9 feet by means of hinged doors inside the hopper. This is particularly advantageous when narrow strips of road are to be surfaced. The amount of material to be discharged is regulated by means of a sliding gate, controlled by a lever conveniently located at the end of the hopper. The N & H mechanical spreader will spread sand, gravel, calcium chloride, crushed stone or slag with equal effectiveness. It is used in cities for spreading sand on icy streets, steep hills, and road intersections in winter and for spreading the fine stone on top of penetration macadam or seal stone on mixed-in-place construction as well as for uniform distribution of fine crushed stone over an asphalt binder to produce a non-skid surface.

THE ADNUN CHIP SPREADER MOUNTED ON A TRUCK



THE BAILEY STYLE-G RELAY PRESSURE VALVE

Controlling Line Pressure by a Relay Valve

One of the most recent developments of the Bailey Meter Co., Cleveland, Ohio, is a relay pressure valve, style G, which is designed to give accurate pressure control of steam, water or gas lines. This relay valve controls the pressure within close limits by regulating the movement of a sylphon-operated or piston-operated throttle valve installed in the line in which the pressure is to be controlled. A minute change in the controlled pressure results in a relatively large change in the motive pressure used to operate the regulating valve. The controlled pressure is connected to the relay valve and serves to actuate a diaphragm against the force of springs. A motive pressure of air, water or steam at 50 pounds per square inch or over is connected to the operating mechanism. A small pipe line connects to the sylphon or piston-operated regulating valve, from which there is an exhaust. The pressure which exists in this line depends upon the position of a diamond valve between a port through which the motive pressure enters and the seat through which the motive pressure exhausts. A handle at the top of the relay is used to balance the force of the springs against the controlled pressure, which is indicated on a pressure gage at the left. The relay pressure is indicated by the pressure gage at the right. This relay valve can be used to operate one valve or a series of valves or pistons.

Blaw-Knox Dust Collection Equipment

The Blaw-Knox Company, Pittsburgh, Pa., has announced the addition of a new department to its organization for the production of dust-collection equipment.

New Sales Organization for Colas

Colas Roads, Inc., 100 East 42d Street, New York, J. J. Harvey, Jr., President, has become the holding company for the organizations which will market Colas and emulsified asphalt for road work throughout the United States. Shell Eastern Petroleum Products, Inc., New York, with J. S. Sawyer, Manager, will market Colas on the Atlantic seaboard. Shell Petroleum Corporation, St. Louis, David Waxman, Manager, will market Colas in the Central States. Shell Oil Co., San Francisco, will continue to market Colas on the Pacific coast area west of the Rockies with J. F. McSwain, Manager. Colas Roads, Ltd., Toronto, with R. G. Wace as Manager, will handle Canadian sales. Compania Mexicana, El Aguila, Apartado 150, Tampico, Mexico, York, with J. S. Sawyer, Manager, will handle sales throughout the republic of Mexico.

Allis-Chalmers Buys Ryan Grader Line

The Allis-Chalmers Tractor Division, Milwaukee, Wis., has announced the purchase of the line of graders built by the Ryan Manufacturing Co., Chicago, Ill. The grader line will be manufactured in La Porte, Ind., in the Advance-Rumely plant which was recently acquired by Allis-Chalmers.

The Ryan line consists of leaning-frame, leaning-wheel blade graders in three sizes and a motor patrol unit. One feature of this line is the ease of shifting the grader's weight from one wheel to the other, to conform with the road conditions encountered. These graders will supplement and round out the line of track-type tractors, industrial wheel type tractors and industrial equipment now marketed through dealers in Allis-Chalmers products in all parts of the United States.

. . . streets that are an ASSET . . . . . *not a liability*

St. Louis Avenue, East St. Louis, Illinois
Trinidad sheet asphalt laid over old brick in 1925.
Still in excellent condition. No maintenance to date.

Dusty roads, streets filled with ruts and "pot holes" are a liability which hurts the prestige of a community and are likely to result in accidents to motorists.

This problem of repairing old roads is confronting many officials . . . perhaps you, who are responsible for the construction and maintenance of streets. If this condition exists in your section, you can solve this problem by converting the old, worn-out streets and roads into modern, long-life, dustless, smooth surface highways by placing an asphaltic top, bound together with Trinidad Lake Asphalt, right over the old, worn-out road.

You can use the present foundation of old concrete, brick, granite, wood-block or macadam and get a new road for the price of an asphaltic top. Think what a saving that means in these days of reduced paving appropriations.

Trinidad Lake Asphalt, created in the Trinidad Asphalt Lake, has been used by many cities throughout the world to resurface old, worn-out streets and roads.

THE BARBER ASPHALT COMPANY
New York Chicago St. Louis San Francisco

TRINIDAD
NATIVE LAKE
ASPHALT

NEW Complete Line of Bituminous Road and Street Machinery

FOR MAKING HOT AND COLD MIXES

All Portable

Road Mix Pavers
Central Cold Mixing Plants
Pug Mill Mixers
Pre-Mix Plants, Hot and Cold
Driers for Sand and Stone
Street Repair Patchers
Asphalt Plants
Tar Kettles, with Spray Pumps
Surface and Tool Heaters

Descriptive Catalog Free on Request

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HICKORY FIBER
for
ROTARY SNOW BROOMS
STREET SWEEPERS
HAND BROOMS

HUNTSVILLE Hickory Fiber for all types of brooms is an unconditionally guaranteed product that will give consistent and economical service over long periods of time—sweeps clean the roughest pavements—handles the heaviest refuse with ease. Each fiber is a live, springy, flexible broom filler made from the best selected green hickory, thoroughly cured, and rigorously inspected. It will pay you to investigate, write today.

The Huntsville "Trade Mark" on every bale is your guarantee. Look for it.

FAULTLESS FIBER HUNTSVILLE HICKORY FOR STREET SWEEPERS

Write today for the Booklet "The Story of Huntsville Hickory"

FRANK H. FORD, President

HUNTSVILLE
FIBER & VENEER WORKS
HUNTSVILLE ALABAMA

A BANTY ROLLER ON A TRAILER FOR QUICK TRANSPORTATION

A New Light Power Roller and a Trailer

A motor roller adapted to rolling fairways and golf courses, tennis courts and athletic fields, and for asphalt patch work and rock asphalt resurfacing, is now being manufactured by the Continental Manufacturing Co., and marketed by the Superior Construction Equipment Co., 1850 South Kostner Avenue, Chicago, Ill. This Banty roller is equipped with hollow watertight rollers, which allows the weight to be varied by the addition of water. When emptied, the roller weighs 2,100 pounds; with both rollers full, it weighs 3,000 pounds. Any desired weight below 3,000 pounds can be obtained by filling the rollers to the proper level.

The roller is powered with a 15-horsepower, 4-cylinder, heavy-duty industrial gasoline engine with electric starter and generator. The clutch is of the spring-loaded type, operated by a foot pedal, and the machine is equipped with one speed forward and reverse. The rollers are built up of plate steel electrically welded and watertight. Each is fitted with a plug for filling with water to vary the weight. The speed of the machine is 4 miles per hour. It is provided with a comfortably upholstered seat, and the general design conforms to automotive construction. The machine is painted a fire wagon red striped with cream.

The trailer, which is a companion machine to the roller, has a capacity of 2½ tons and can be towed at 35 miles per hour with safety. It can be used not only for transporting the roller, but for moving other construction tools. It is built with a fabricated steel hot-riveted front axle and fifth wheel and arranged so that the trailer can be turned at a 60-degree angle. Skids are carried in brackets at the side, where they are used as sideboards to keep the load on the trailer. The floor is of heavy fir, giving plenty of material for bolting or spiking down anything to be carried. The trailer is painted to match the roller.

District Manager Appointed

Four Wheel Drive Auto Co., Clintonville, Wis., has announced the appointment of J. R. Gray as District Sales Manager in charge of the eastern Pennsylvania and southern New Jersey territory. Mr. Gray has been associated with the FWD organization for fourteen years, during the past three of which he has been in charge of sales in southwestern Wisconsin.

Vehicle-Actuated Traffic Control Without Contact

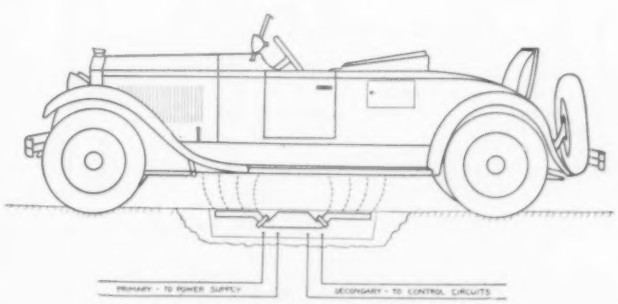
Inductive actuation of traffic signal lights, without contact, is a new method as far as the control of motor vehicles on highways is concerned. This method transmits an impulse from the roadway element to the timing apparatus by a vehicle entering the magnetic field of a detector which is imbedded beneath the road surface and completely covered by the regular paving material. This system is known as the Trafilator and is the outgrowth of the Miller induction train control system used extensively by railways and approved by the Interstate Commerce Commission. Its adaptation to vehicular control of traffic signal lights was made by engineers of the Miller Train Control Corporation, Staunton, Va.

The Trafilator is composed of three units—a detector, a combination relay and rectifier, and a condenser. The most important of this group is the detector unit, which has no make-or-break electrical contact and depends upon its action by changes in reluctance in the magnetic field of the detector. This unit, which operates on the magnetic Wheatstone bridge principle, consists of two cores of laminated transformer steel upon which four coils, two primary and two secondary, are wound. A primary coil in the detector is connected through an underground cable to a source of alternating current. The secondary coil in the detector normally energizes a relay in the control cabinet. The steel structure of the motor car in proximity to the detector attracts the magnetic flux from the primary and redirects it from its normal lateral direction to a longitudinal direction. This reversal of magnetic flux deprives the secondary coil of its energy, and allows the relay armature in the control box to drop on its back contact. Therefore, it does not depend for its operation upon the weight, sound or shadow of the approaching vehicle. Properly installed, the detector requires no attention, costs nothing to maintain and is not affected by rain, snow, ice or other weather conditions.

Trafilators will detect street cars just as reliably as they will other vehicles, and no special equipment is required on or between the rails or trolley wires. Another feature which has found application in connection with route signaling, is the delay circuit. The circuit works in conjunction with the standard detector and enables it to distinguish between moving and standing vehicles.

Another feature is that the detector circuits operate on the closed circuit principle, so that any failure in the detector's circuits or its interconnecting cables will cause the lights to automatically operate on a pre-timed basis until the circuits are restored to normal. This feature is of importance, particularly at intersections where any failure of the signals might cause serious congestion of traffic.

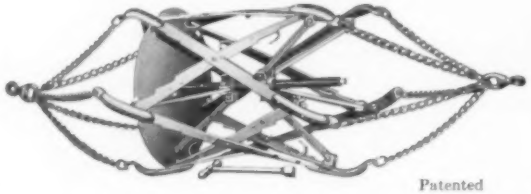
The control equipment is designed to give the highest efficiency with minimum complication. Standard signaling equipment is used throughout, so that adjustments can be readily made by the average maintainer. Trafilator control equipments are available in a great variety of types to meet the needs of different intersections. They can be furnished for semi-actuated or full-actuated control with any type of change sequence. Although most intersections are operated with two movements, Trafilators can be furnished with three or more movements to provide for special turn signals, multi-street intersections, pedestrian signals, or other special conditions.



A TRAFILATOR WITH A VEHICLE ABOVE IT, SHOWING THE MAGNETIC FLUX FROM THE DETECTOR BEING ATTRACTED AND REDIRECTED BY THE PROXIMITY OF A VEHICLE

THE EXPANDING SEWER CLEANING METHOD

Will solve this serious problem for your community as it has for others. Give it a trial for 30 days.



Patented

The expanding root cutter and sewer cleaner with the 14" removable sediment disc. Four sizes with each cutter. Adjustable from 6" to 30" sewers.

July 30, 1931.

Gentlemen:

We have been getting excellent results from the Expanding Sewer Machine. We have given your root cutter a thorough trial during the time we have been using it. The machine is a very satisfactory one for removing roots and cleaning out sewers of any size. In fact it is the only machine we have ever used that produces satisfactory results, and we unhesitatingly recommend it to any one considering the purchase of sewer cleaning equipment.

Yours very truly,
G. L. LIGHTSEY,
City Clerk,
Laurel, Miss.

Complete Sewer Cleaning Equipment

Write for literature; let us know your wants.

EXPANDING SEWER MACHINE CO.
NAPPANEE, IND.

The Swimming Pool A Civic Responsibility

INFILCO PRODUCTS

Aerators
Automatic Boiler Blowdown
Basin Level Controllers
Chemical Proportioners
Clarifiers
Coagulant Feeders
Deckhouses
Depth Gauges
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Disk Filters
Dry Chemical Feeders
Filtration Plants
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Flow Indicators
Gravity Filters
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Iron Removal Plants
Loss of Head Gauges
Lime-Soda Water Softeners
Lime Slakers and Feeders
Manometers
Orifice Feed Boxes
Oil Removal Filters
Proportioning Equipment
Pressure Filters
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Attractive and Safe

THE many means of making a pool outwardly attractive and inviting are useless—if not dangerous—unless the vital, hidden equipment maintains **clean, clear, safe** water.

International Pool Equipment — Filters, Hydraulic Single Valve Controls, Chemical Feeders, Flow Indicators, Flow Controllers, Lint Catchers, Pool Cleaners, Fittings, Test Kits and Recirculating Equipment—provides undivided equipment responsibility and assures continually **attractive** as well as **safe** water.

Send for Bulletin giving typical layouts of the modern pool.

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Cast Iron Pipe

for Water and Gas

Cast Iron Pipe and Special Castings, Bell and Spigot, Flange, Flexible Joint, Culvert, Milled and Plain End Tubes, Cylinders, Flanged and Bell and Spigot Fittings, High Pressure Fire Service Pipe, Warren Short Body Specials.

Size 2- to 60-inch

Pipe manufactured in accordance with standard specifications adopted and approved by water works associations and engineers.

Warren Foundry & Pipe Corp.
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Warren Foundry and Machine Co.

Sales: **Bowling Green Building, New York City**
Offices: **75 Federal Street, Boston, Mass.**

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and addresses of reliable manufacturers of any kind of machinery or material for use in connection with municipal improvement work of any kind? If so, please advice us as to your wants, and we will arrange to have any desired catalogs or prices forwarded to you promptly.

This is a service which we render without charge to all readers of THE AMERICAN CITY or THE MUNICIPAL INDEX. and we hope you will take frequent advantage of it.

THE MUNICIPAL INDEX
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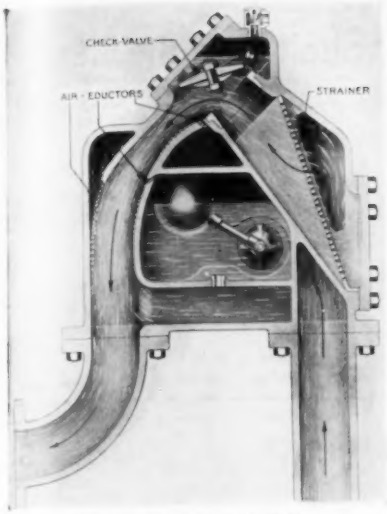


THE HAZLETON SUCTION LINE PRIMER

Suction-Line Primers for Centrifugal Pumps

A suction-line primer which exhausts the air from the suction line and fills it with water, strains the water and keeps large particles from getting into the centrifugal pump, has been announced by Barrett, Haentjens & Co., Hazleton, Pa. The operation of the Hazleton suction line primer is simple and prompt. It does not reduce the efficiency of the centrifugal pump to which it is attached, and the loss caused by friction through the primer is only slightly greater than the loss through a standard strainer and check valve. It can be applied to any moderate-sized suction-lift centrifugal pump, whether its operation is controlled automatically or manually.

The pump and primer must be filled with water before the initial start. This is done through a suitable opening in the discharge line. The pump is then started and draws water from the central chamber, creating a vacuum which causes air from the suction line to rush through the check valve into the chamber. When the chamber is pumped empty, the float falls and tilts a mercoid switch, whereupon the pump stops. The water now rushes back from the discharge line, refills the chamber and pushes the air trapped by the closing of the valve into the discharge line. When the chamber is completely refilled, the float rises, tilts the switch and again starts the motor. Every short run of the pump removes from the suction line an amount of air equivalent to the contents of the entrance chamber, the falling and rising level performing the same function as the piston of an air pump.

When water from the suction line enters the chamber, continuous flow commences. Eductors then rid the chamber of air. When the pump is stopped, the check valve closes and prevents the draining of the suction line. The check valve, being located at the high point and mounted on an angle, is not likely to leak, and since all the stuffing boxes are under pressure, air cannot enter the suction line. The pump therefore remains primed, and pumping will commence immediately when the starting switch closes.

Inspection of Test Paints on the Inside of Water Tanks

A few months ago we reported that the Pittsburgh-Des Moines Steel Co., Pittsburgh, Pa., and the borough of Ambridge, Pa., were jointly conducting an extensive test of paints for the interiors of water tanks. The fourth inspection of the 196 paint panels was made February 15, 1932, after 130 days' exposure. Following are the average ratings for various groups of paints into which the panels have been classified:

Classification	Average Rating for Class
Hot bituminous coatings	98.9%
Red lead and linseed oil paints	89.7
Aluminum paints	88.0
Asphalt emulsions (plain)	86.0
Thick plastic coatings	85.2
Clear varnish finishes	82.8
Elaterite paints	82.2
Coal tar paints	82.1
Synthetic gum vehicle paints	74.0
Asphalt emulsion and filler	74.0
Miscellaneous cold bituminous paints	71.3
Other linseed oil paints	67.0
Gilsonite asphalt paints	64.3
Pyroxolin base paints	60.0

	Oct. 15, 1931	Feb. 15, 1932
Average rating of unclassified panels	92.0%	72.5%
Average rating of all panels	94.6	76.3

Two New Truck Models

A 1½-ton, 6-cylinder truck chassis and a high-speed 5- to 6-ton model have recently been announced by the Federal Motor Truck Co., Detroit, Mich. The new 1½-ton model has standard Federal features and is powered with a 6-cylinder L-head type engine, 3⅜-inch bore and 4-inch stroke developing 72 horsepower. Other features of this model include four-speed transmission, four-wheel hydraulic brakes, full floating rear axle, 10-inch heavy clutch and a heavy pressed steel frame 6 inches deep, ¼-inch thick, with 2¾-inch flanges. Four wheelbase lengths are provided, 130, 142, 154 and 166 inches. Standard tires are 6.00/20 6-ply balloon front and 32 x 6 single high-pressure rear, mounted on ventilated disc type demountable wheels.

The new 5- to 6-ton model, designed for rapid transportation and other heavy-duty service, has heavier construction throughout, a larger motor, larger tires and many new features. The extra-heavy construction includes a 14-inch clutch, two-range 7-speed transmission, full floating double reduction type rear axle with new high traction differential, a massive steel frame, high-grade alloy steel springs and auxiliary springs, a 7½-inch channel steel front bumper and heavy 10-stud ventilated disc-type demountable wheels, single front and double rear, equipped with 9.75/20 balloon tires. Power is supplied by a 4⅜-inch bore x 4¾-inch stroke overhead valve, 6-cylinder, 7-bearing engine with dual ignition. This model is built with Westinghouse four-wheel air brakes or four-wheel hydraulic brakes with vacuum booster. The available wheelbases are 153, 165, 177, 185, 213, 231 and 249 inches.

Other features of these new models are the Federal Reservoil oiling for springpins and cross-shafts, roller-bearing steering gear, improved mounting of battery and tool-box in back of the running-board shields, a new and distinctive-type chromium plated radiator, large chromium head lamps and twin electric horns.

A New Aerial Survey Service

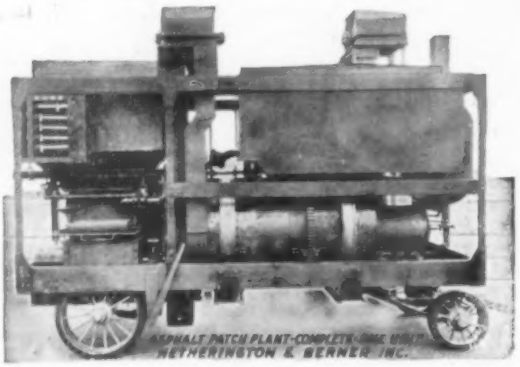
Papin Aerial Surveys, 1901-03 Lucas Avenue, St. Louis, Mo., started operations the first of 1932 as a subsidiary of the P. R. Papin Photo Co. H. B. Weeks, Manager of Papin Aerial Surveys, has ten years' experience in the aerial photographic field. For the last two years he has been connected with the Curtiss-Wright Flying Service as District Photo Manager in the Mid-West. Associated with him are two experienced layout engineers and "Shorty" Chaffee as photo pilot and mechanic. A unique service to clients is flying the engineer in charge of the project over the area for an aerial reconnaissance of what he will later see in the aerial photographs.

A New Power Lawn Mower

A new power lawn mower with an enlarged power plant has been announced by the Moto-Mower Co., Detroit, Mich. This new model, called the Super-Detroit, is powered with a 2-horsepower engine which is ample to climb steep grades while cutting. Twist-of-the-wrist guiding allows the operator of the mower to make short turns by merely turning the right or left handle grip. Grass around trees and flower-beds can be cut by this machine, eliminating hand trimming.

The inclusion of a mechanical governor enables the operator to hold the machine automatically at any set speed between 1,800 and 2,400 r.p.m. Whether the grass is thick or thin, whether the grade is steep or gentle, the mower maintains its rate. The manufacturers claim that this 27-inch swath mower can easily cut five acres of lawn a day. There are available with this new model two types of sulky riders, one having motorcycle type pneumatic rubber tires, and the other having cast iron wheels.

THE NEW SUPER DETROIT POWER LAWN MOWER



A Real Asphalt Patch Plant

A PORTABLE UNIT WITH A CAPACITY OF 400 YARDS PER DAY

ACCURATE CONTROL OF MATERIALS ASSURING ACCURATE MIXTURE TO COMPLY WITH ANY STANDARD SPECIFICATIONS

Send for Bulletin R-400

HETHERINGTON & BERNER, INC.

INDIANAPOLIS, IND.

Stationary — Railway — Portable & Semi-Portable Plants

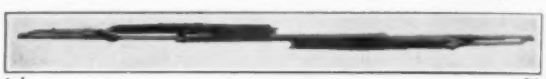
Above: McCurdy Road Guard in Use
At the right: Collapsed for moving to the next job

McCurdy Road Guards

All—Steel—Adjustable—Collapsible

It's a quick and easy matter to close a street to traffic while repairs are going on, if you own a pair of McCurdy Road Guards. They are easy to transport to the job—simply carry them collapsed on your running board. You can set one of these guards up in one minute—and take it down and collapse it in one minute when the job is finished. Being made of all-steel, a McCurdy Road Guard will stand all kinds of hard knocks and won't break or wear out in many long years. It's considered everywhere the most efficient and economical road guard obtainable for street repair work. Price $5.80 each. Write for our illustrated circular.

McCurdy Steel Products Company



Ada, Ohio

IN planning the future development of your community include in your program Wood D6 hoist and C4-1½-yard, straight side body units as shown above. New features and betterments make these units more than ever the ones to buy for lowest maintenance costs. They are outstanding for capacity, sturdy construction, long life, unsurpassed economy, fast, efficient performance and that fine appearance that Wood alone can give. Investigate the advantages of this and other larger units profusely illustrated and described in literature free to any municipal official.

WOOD HYDRAULIC HOIST & BODY CO.
DETROIT MICHIGAN

WOOD HOISTS & BODIES

The "Century" 100% Uniform Bow

"Once Worn—Always Worn"

Endorsed by the best dressed uniform organizations in United States and Canada.
—holds its shape
—made of genuine leather
—never cracks or discolors

Send 50c for sample and write for quantity prices

THE "CENTURY" TIE COMPANY
9377 Woodside Detroit, Mich.

ROOT

HYDRAULIC SCRAPERS

To economically maintain gravel, cinder, slag or earth streets use the ROOT Hydraulic-operated speed Scraper.

Replaces to a large extent the slow-moving tractor, covers twice the mileage at half the expense. *Send for additional information.*

ROOT SPRING SCRAPER COMPANY
Kalamazoo, Michigan

A VIEW LOOKING NORTH THROUGH THE THIRD HOUSE FROM THE EAST IN UNIT THREE AT THE NEW BAY VIEW SEWAGE TREATMENT PLANT, TOLEDO, OHIO

Glass Enclosures at the Toledo Sewage Treatment Plant

The sludge beds for the new Bay View sewage treatment plant at Toledo, Ohio, are completely enclosed in glass houses furnished by the Foley Greenhouse Manufacturing Co., Forest Park, Ill. These consist of four units, each unit comprising twelve structures or enclosures, each of which is 20 feet wide x 160 feet long. The roof of each enclosure is provided with continuous roof ventilators. On six of the enclosures of each twelve in the unit, the roof ventilators are placed on one side of the structure and on the other six enclosures they are placed on the opposite side. Outswinging side ventilators are provided on all the side walls. These outswinging ventilators are installed immediately above the masonry walls.

In each enclosure there is a pair of double doors on one end through which the industrial track passes. Each unit is also provided with a single door on the side wall, and from this single door a galvanized grating walk continues across the twelve houses. The grating walk is made removable where the industrial track crosses it, so that the cars may run the full length of each structure.

The entire superstructure steel framework of these glass enclosures is of galvanized steel. The gutters used between the enclosures and on the outside walls of each unit are the Foley patented galvanized crowned channel gutters. The steel rafters and supporting posts are spaced 10 feet apart. There are seven lights of 16-inch glass between each two rafters. The framework which receives the glass is made of redwood. This range of 43 enclosures required 3,623 boxes of glass to glaze them. The glass is bedded in an elastic glazing composition, and each light of glas is tacked with copper glazing points.

A. A. Johnson Takes Over McEverlast

The Arthur A. Johnson Corporation, contractors, 3rd and West Avenues, Long Island City, N. Y., has announced the purchase of the assets and good-will of McRae Paint Products, Inc., and McEverlast, Inc., manufacturing and selling units engaged in the distribution of the well-known Hunt process of curing concrete and McEverlast pipe line coatings. Arthur A. Johnson, President, states that a new corporation will be formed which will combine the activities of the old company, continuing the business on a basis of national and international distribution. G. R. March, formerly Vice-President and Eastern Manager of McEverlast, Inc., will be associated with Johnson. The names of the officers of the new Johnson-March Corporation will be announced in the near future.

A Light Compression Motor Tandem Roller

A multi-cylinder motor tandem roller designed particularly for use where light compression is desired is being built by the Buffalo-Springfield Roller Co., Springfield, Ohio. It has proved most successful in the rolling of brick pavement prior to joint filling and is also adapted to asphalt patch work. The roller reverses with a gear shift, has a radiator on one side and is equipped with a horizontal steering wheel. A spray bar on the rear roll is used to wet down the roll when working on asphalt patching. This machine is substantially built of steel channels and boiler plates constructed in such a manner as to form a rigid foundation for the motor and transmission. The front or guiding roll consists of two sections revolving independently on a steel axle. They are 26 inches in diameter, and the two form a continuous drum with a 32-inch face. The drive roll revolves on a 2¼-inch steel axle, each end of which is clamped in a bracket secured to the main frame. The rim is of proper width and length to form a drum 34 inches in diameter with a 40-inch face.

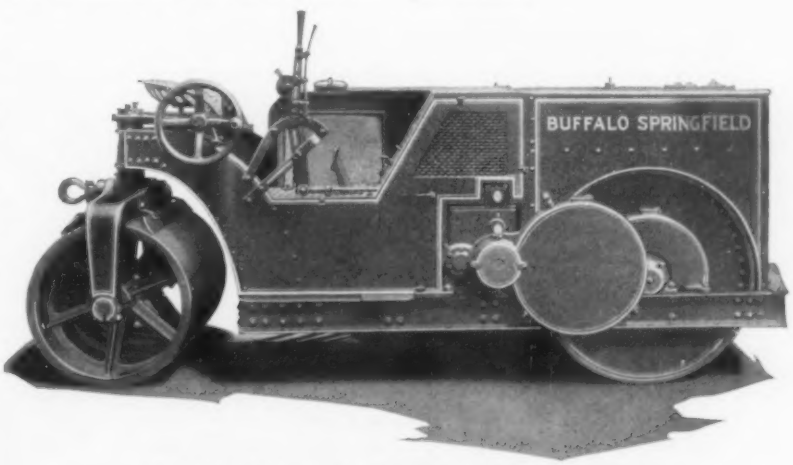
The driving gears are all of steel, machine-cut from solid steel blanks. The high-speed gears are hardened and run in an oil bath. The friction clutch for the reverse transmission is in the flywheel of the motor. Reversing the direction of motion of the roller is accomplished by shifting gears with a hand lever to the right of the operator. The clutch and brake are operated by foot pedal. The motor is a heavy-duty 4-cylinder, vertical, 4-cycle type with a water cooling system.

Seaberg Now a Special Representative for Dresser

Grover E. Seaberg, Service Engineer of the S. R. Dresser Manufacturing Co., Bradford, Pa., has been appointed a special representative for the company to the water-works industry. The rapidly increasing demand for Dresser couplings, clamps and sleeves for water-line service is reported to be the reason for Mr. Seaberg's new assignment as special representative.

Worthington Appointments

Worthington Pump & Machinery Corporation, Harrison, N. J., has announced the appointment of Clarence E. Searle as Vice-President in charge of sales. Mr. Searle has been General Representative in charge of sales for seventeen years, with the Allis-Chalmers organization. C. E. Wilson, formerly General Sales Manager for Worthington, has been appointed Vice-President in charge of industrial relations. Charles N. Barney, for the past fourteen years Worthington's Secretary and General Counsel, has been appointed Secretary-Treasurer and General Counsel.



THE BUFFALO-SPRINGFIELD LIGHT COMPRESSION MOTOR TANDEM ROLLER

BUFFALO-SPRINGFIELD

Travel the Lincoln or the famous "40." Take the byways as well as the highways, or the streets of our cities, large and small. The Buffalo-Springfield meets your gaze. You find them everywhere—some venerable with age and years of service—others new and of latest models.

All practical sizes, steam and motor types.
Attachments, including scarifier, optional.

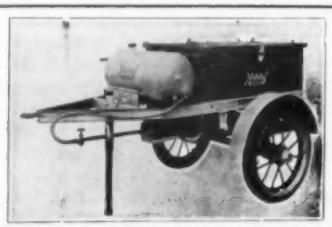
THE
BUFFALO-SPRINGFIELD ROLLER CO.
SPRINGFIELD, OHIO, U. S. A.

ACME 4'-5' SNOW PLOW ATTACHMENT

Priced within the reach of every village and township.
Light, powerful, efficient, inexpensive.

Ask for Details — Write for Prices
ACME ROAD MACHINERY CORPORATION
FRANKFORT NEW YORK

Hotstuf



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POURING POTS, ASPHALT SPRAY PUMPS

Dealers in Principal Cities

MOHAWK ASPHALT HEATER CO.
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In Boston It's
The KENMORE
One of Boston's newest and finest Hotels

ADMIRABLY located in the heart of Boston's Back Bay district. This four hundred room hotel offers the traveler deluxe accommodations at moderate rates.

Let us send you a booklet on "Historical Boston"

Carey Elastite EXPANSION JOINT

makes *Good* Paving *Better*

The "sandwich" joint which protects concrete paving against expansion and contraction stresses. Proved by 20 years' use in highways and sidewalks in all parts of the world. Large stocks in principal cities insure immediate shipment. Write for catalog and 1932 prices.

THE PHILIP CAREY COMPANY
Department E-1 Lockland, Cincinnati, Ohio
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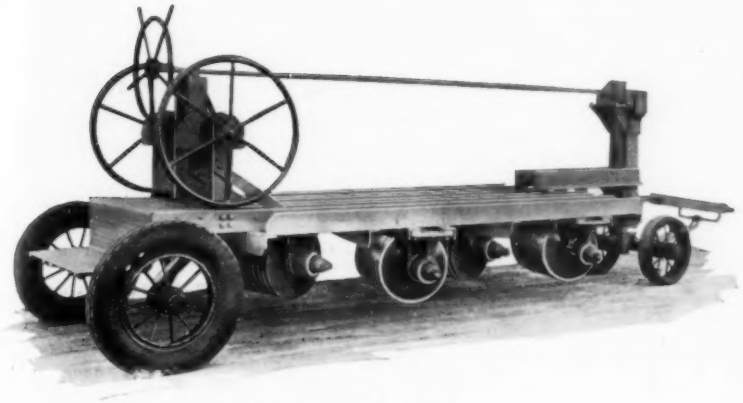


THE KILLEFER I-A ROAD DISC

Multiple Discs Cut Bumps from Oiled or Asphalt-Treated Streets

The removal of bumps in old oiled roads or asphalt-surfaced streets and roads is a matter of only a few minutes with the Killefer road disc machine, made by the Killefer Manufacturing Corporation, Ltd., 5525 Downey Road, Los Angeles, Calif. These machines are built with four sets of cutting discs. The two forward sets are worked shallow and the rear discs deeper. The best work is done by this machine in warm weather when the pavement is soft. It requires comparatively small power, such as a 20-horsepower tractor or a truck. Traffic need not be taken off the street or highway while the work is in progress, for there are no flying pavement chips. The cutting edges press downward into the high spots instead of chiseling or gouging them upward, with the attendant danger to operators and passing traffic. The hidden manholes and car tracks can be crossed with safety, as the discs roll over them, and there are no pointed tools to catch on hidden obstructions.

The roadbed material is not disturbed by the discs for there is no lifting action. The discs cut without chatter or clogging, since the material does not gather in front of them. The disc blades are electric-treated steel, 20 inches in diameter and 5/16-inch thick. Killefer road discs are now made in two models. One is equipped with rubber tires and rear controls, and can also be obtained with steel tires instead of rubber. The other model is equipped with steel tires and top controls. These machines work a strip of pavement 45 inches wide. The disc blades are arranged in four gangs, two in front and two in the rear. The rear discs make their cuts half-way between the cuts of the gangs ahead. In this way the small markings left on the pavement are only one inch apart. A grader pulled behind the road disc pushes the cuttings to the side, leaving a smooth roadway.

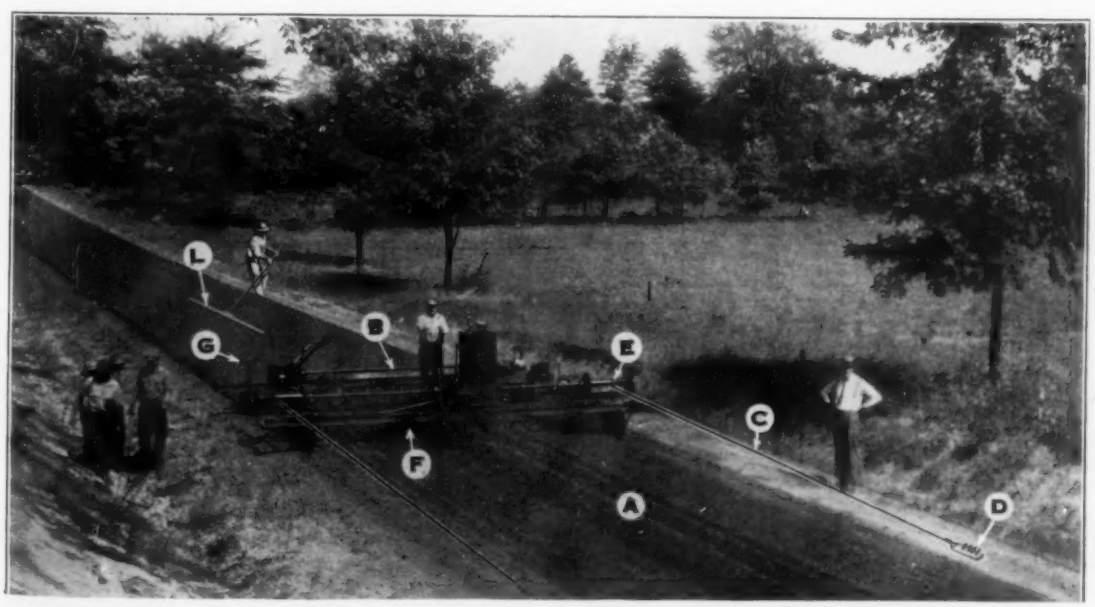
A Mechanical Spreader and Surfacer for Black Top

A power-driven machine for retread work handling macadam, sand, asphalt, and tar-bound surfaces, capable of producing one mile of pavement per day, has recently been announced by The Heltzel Steel Form & Iron Co., Warren, Ohio. As shown in the accompanying illustration, the retread material is placed in a windrow (A) along the center of the road, as the final operation of mixing by the usual blading methods. The rear final spreader (B) does the final crowning of the material. A pair of steel cables (C) approximately 300 feet long and anchored as at D are wound on two drums (E) at either side of the machine to pull it forward. The drums are operated at the same rate when working on the straightaway, or can be operated independently when negotiating curves. A V-shaped spreader and leveler (F) splits the windrow and spreads the material out to the side runners, which are set to the desired width of road. Adjustable screws (G) regulate the height of the spreader. The manufacturer states that straight-edging illustrates the even spread of the material after one pass of the machine. The machine moves forward normally at a rate of 12 to 15 feet per minute and can be moved backwards under power by reversing the cables.

Grothaus Made General Representative

Allis-Chalmers Manufacturing Co., Milwaukee, Wis., has announced the appointment of L. W. Grothaus as General Representative, succeeding C. E. Searle. He became affiliated with Allis-Chalmers in 1904 and has occupied various offices with that company.

Superintendents of Municipal Diesel-Electric Plants are urged to aid the A. S. M. E. Sub-Committee on Oil-Engine Power Costs by returning their questionnaires to the Secretary, M. J. Reed, 30 Church St., New York, by March 15.



THE HELTZEL BLACK-TOP SPREADER AND SURFACER

Outdoor Lighting

A Section of *The American City*
Devoted to the Lighting of Streets, Highways, Bridges, Airports, Athletic Fields and Parks, and the Floodlighting of Public Buildings

Lighting Four Great Interstate Bridges

By **CHARLES CARSWELL**
Assistant Engineer, The Port of New York Authority

With the George Washington Bridge over the Hudson River as the crowning achievement, a group of four magnificent bridges spanning waterways between Greater New York City and New Jersey have been built in recent years by the Port of New York Authority, a public body created in 1921 by compact between the states of New York and New Jersey, and charged with the working out of problems concerned with the development of this great interstate port.

Among these problems is the lighting of these four bridges, and, believing that readers of THE AMERICAN CITY *will be interested in the arrangements for this purpose, we are glad to present the following detailed description, thus supplementing with additional noteworthy examples the discussion of "Bridge Illumination" by R. M. Swetland in last month's issue.*—THE EDITORS.

THE Outerbridge Crossing and the Goethals Bridge—the two Port Authority bridges over the Arthur Kill between Staten Island and New Jersey—are each lighted by incandescent lamps on constant-current series circuits on the bridge structure and approaches, and on multiple circuits on the plazas. Each of these bridges has a roadway 42 feet wide between curbs, and a 5-foot sidewalk on each side. The lighting standards are along the railings on the outer side of each sidewalk. The standards are opposite each other and spaced 120 feet apart, with the lights 15 feet above the roadway. Each light has a 4,000-lumen lamp, mounted base down and enclosed in a rippled glass globe with refractor, and an opaque glass canopy.

Current Supply

A constant current of 6.6 amperes is supplied to the primaries of individual transformers located at each standard. The 4,000-lumen lamps, about 225 watts, use 15 amperes each. The individual transformers have windings, however, to permit the installation of 6,000-lumen lamps, about 330 watts, using 20 amperes each, if such change in the installation should ever be desired. In addition to the roadway and sidewalk lights, each bridge has "aviation" lights—250-candlepower units along the upper chords of the trusses. The Outerbridge Crossing has eight such lights and the Goethals Bridge six on each of the two trusses. Each bridge also has regulation navigation lights.

Each of the Arthur Kill bridges has two independent sources of power, one from the Staten Island Edison Co., the other from the Public Service Electric & Gas Co. of New Jersey. Each company delivers 2,300-volt, 60-cycle alternating current, the power being brought, in each case, to a transformer room at the end of the approach. The roadway lights are so wired in circuits that alternate lights on each side are fed from one source, and the intermediate lights from the other source. The aviation lights on each side of the bridge are fed from separate sources, and the navigation lights are fed from both sources. Plaza lights are fed by the local source on each side.

The lighting units for both bridges are of General Electric manufacture. On the plazas King ornamental standards are used; on the bridges and approaches, pipe standards, furnished and installed by Erickson Equipment Co.

The Bayonne Bridge over the Kill van Kull is lighted by incandescent lamps on 120-volt multiple 3-wire circuits. The bridge roadway is 40 feet wide between curbs and there is one sidewalk 5 feet wide. On the arch span this sidewalk is nearly 20 feet away from the roadway and at the portals is independently lighted. The lighting standards are, in general, along the curbs, with the units 22 feet above the roadway, opposite each other and 120 feet apart. Each unit is of the pendent type, and is equipped with a 300-watt bulb, a refractor and a diffusing glass globe. The units are designed so that 500-watt bulbs may be installed

NIGHT VIEW OF BAYONNE BRIDGE

STATEN ISLAND APPROACH, BAYONNE BRIDGE

in them. On the upper chord of each of the two arch trusses an aviation light having two 200-watt bulbs is located at mid-span, and ten 50-watt bulbs are spaced uniformly along the chord to outline it at night. Regulation navigation lights are of course provided. The Staten Island Edison Co. delivers alternating current at the end of the Port Richmond approach at 6,900 volts, single phase, 60 cycles. The Public Service Electric & Gas Co. of New Jersey delivers single-phase, 60-cycle alternating current on the Bayonne side at 2,400 volts. The lights throughout the bridge and approaches are wired in circuits such that alternate lights are fed from each source. Graybar lighting units are used, mounted on King standards.

George Washington Bridge

The George Washington Bridge over the Hudson River, the world's longest suspension bridge, is lighted by incandescent lamps on 120-volt multiple 3-wire circuits. The main bridge has two separate roadways 28 feet 9 inches wide between curbs, and two sidewalks 12 feet wide. The main New York approach roadway is 60 feet wide between curbs. The New Jersey approach roadway is generally 90 feet wide, but has wider areas for connecting roads and for toll plazas.

The main bridge will, in the future, be paved in a central area which separates the two roadways, and will then be 90 feet wide between outside curbs. The lighting standards are along these outside curbs and along the curbs on the approaches. The units are 18 feet above the roadway, opposite each other and, in general, 90 feet apart. Each unit is of pendent type, with refractor and diffusing glass globe, equipped with a 300- or a 500-watt bulb, depending upon the roadway width. The bridge cables are outlined at night by "aviation" lights consisting of 60-watt bulbs at each panel point, 60 feet apart horizontally. Regulation navigation lights are provided.

The main toll plaza area is 185 feet wide between curbs. To avoid placing standards in the traffic area, this plaza is lighted by floodlights placed in four towers. Each tower is 110 feet high and has eight 500-watt lights. There are two towers at each end of the plaza area, the length between them being 465 feet.

The United Electric Light & Power Co. delivers 208-volt, three-phase, 60-cycle alternating current on the New York side, and the Public Service Electric & Gas Co. of New Jersey delivers 4,160-volt, three-phase, 60-cycle alternating current in Fort Lee. The lights are wired in circuits such that alternate lights are fed from each source of power supply. As on the Bayonne Bridge, Graybar units are used, on King standards.

NEW JERSEY TOLL PLAZA, GEORGE WASHINGTON BRIDGE

A Floodlighted Bridge in California

COLORADO STREET BRIDGE, PASADENA, CALIF.

The concave side of this curving bridge is floodlighted by 40 G. E. Novalux 1,000-watt projectors

Illuminated Cascades

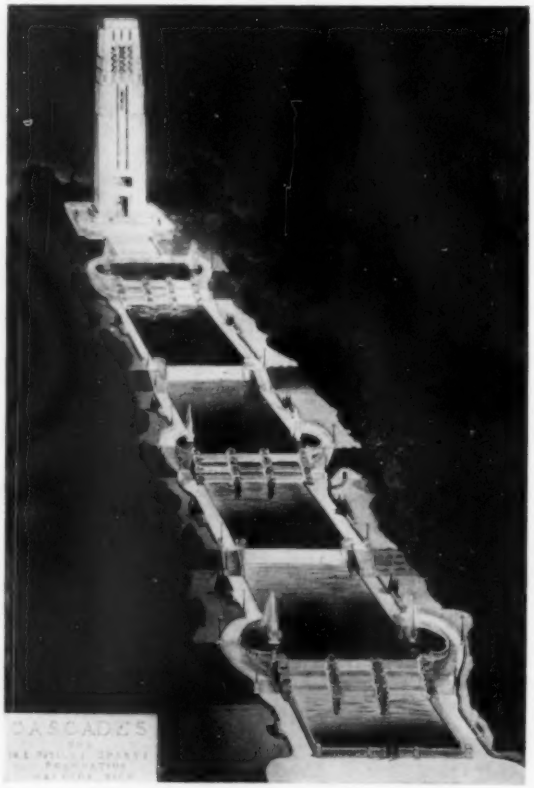
By A. W. D. HALL

Chief Engineer, William and Matilda Sparks Foundation, Inc., Jackson, Mich.

A PARK of 465 acres is being created for the people of Jackson, Mich., by the William and Matilda Sparks Foundation, Inc., a corporation organized by William Sparks, his wife and two sons for the purpose of developing a public park to be presented to the citizens when completed. The park contains an eighteen-hole golf course; a beautiful club house; a system of lakes and canals for canoeing, skating, etc.; a Prado 2,100 feet long; and plans are being made for a tower 170 feet high which will have an observation platform on top, and be provided with a carillon, an elevator and rooms for art and matters of historical interest; beautiful winding drives are built through the property. Near the center of the park is a hill about 75 feet high, and Mr. Sparks decided to have a series of waterfalls or cascades flowing down the side of this hill, illuminated at night with colored electric lights.

Investigation was made to see what had been done along these lines. It was found that nothing of the kind had been done in this country. At Barcelona, Spain, however, an installation had been made, but not along lines combining efficiency with economy. So an experimental fall was built 10 feet long and 10 feet high, and a pump having a capacity of about 300 gallons per minute, a meter for measuring the quantity of water and gages to register the depth of water going over the crest were installed in order that the economical amount of water could be determined in conjunction with the lights to obtain the best results.

Lights were tried both under the crest and submerged at the bottom of the falls. It was decided to use the crest lights. The shape of the crest made a decided difference in the water effect, and only after many tests had been made was a crest selected. The water, in order to refract the light, must be broken up, and not flow over in a smooth sheet. Many tests had to be made before deciding how this should be done.



After conducting these tests and experiments, which extended over a considerable period of time, plans were made which combined the results of the tests with pleasing architectural effect. The total length of the cascades is 500 feet; the vertical height is 64 feet, divided into 11 falls; the width is 60 feet; the walks along each side are 8 feet wide with steps around the pools. The structure is of reinforced concrete and contains 1,100 cubic yards, exclusive of the walks, steps and balustrades. There are three pools 30 x 90 feet, each pool containing two fountains.

The fountains each have a center jet, three smaller jets around the center, and a ring 5 feet in diameter containing 65 small jets. The water form changes constantly, this being accomplished by thrustor valves, and each fountain is illuminated with seven 1,000-watt lamps. To supply the falls and fountains, a pumping station is required containing one horizontal direct-connected centrifugal pump with a capacity of 2,000 gallons per minute, and one with a capacity of 1,000 gallons per minute. These two pumps would supply water for a city of 30,000 population. They are equipped with remote control, so that the water and lights are controlled from a central station by push-buttons.

To illuminate the falls and fountains, 1,230 lamps are required with a total wattage of 241 kw. The lights are in three colors—red, blue and green, the cardinal colors of light. By blending these colors, every shade in the spectrum of the rainbow is obtained. This is accomplished by the Thyraton reactor dimmer control as developed by the General Electric Co. for mobile color lighting. By this method of control, which is operated by tubes similar to radio tubes, any desired lighting effect can be obtained.

This installation has the distinction of being the first of its kind in the world, and will, no doubt, be viewed by thousands of people. It is expected to be in operation in the spring of 1932.

Photoelectric Cell Controls Navigation Lights on Bridge

RIVER boat pilots and the "electric eye" are becoming bosom friends, says *The Electric Journal*. This companionship is not so strange as it might seem. A photoelectric-cell light-control unit has taken over the task of turning on and off the warning and navigation lights on the Point Bridge at the confluence of the Allegheny and Monongahela Rivers to form the Ohio River at Pittsburgh, Pa. Now when daylight fails, either in the evening or on very dark days, the three lights on each side of the bridge are lighted without human attention.

When daylight again becomes sufficient for the bridge span and piers to be readily seen by river pilots, the lights are again turned off. By this scheme it is unnecessary for a man to come around in the evening and again early in the morning to attend the lights. Also it is assured that the lights will be in operation whenever needed—be it before or after scheduled nightfall.—*Transactions* of the Illuminating Engineering Society, February, 1932.

County Extends Highway Lighting in Five Directions

THE SCHENECTADY-MARIAVILLE ROAD AT NIGHT

SCHENECTADY COUNTY, N. Y., of which the city of Schenectady is the county-seat, has been the scene of active and encouraging highway-lighting progress for over two years, culminating in the installation of 14.8 miles of lighting on the Schenectady-Mariaville Road in the latter part of 1931, bringing the total for the county to some 32 miles.

The Mariaville project is the last, to date, of a series of highway-lighting installations in the county, starting with a stretch of approximately 1.8 miles on the Schenectady-Amsterdam Road, the lighting of which was carried out as a demonstration through cooperation of the county authorities, the power company and the equipment manufacturers; it was placed in operation September 9, 1929. This was followed on July 4, 1930, by the lighting of about a mile of the Schenectady-Albany Road; and on October 2 of that year some five miles of the road to Troy was lighted. In the next month, November 15, about six miles of highway lighting was added to the original installation on the Amsterdam Road. On April 4, 1931, about two miles of lighting went into service on the Schenectady River Road, supplemented by another two miles on April 14.

The largest single installation consists of the 14.8 miles on the Mariaville Road, this lighting becoming effective October 15, 1931. This project was authorized by the Board of Supervisors of the county on May 12. The newly lighted road extends in a westerly direction from the outskirts of Schenectady, passing through South Schenectady, Rynex Corners and the village of Mariaville to the Montgomery County line. This road has been known as hazardous for night driving, having many curves and grades, a surface not in the best of condition, and a liability to fogs. It draws considerable traffic, nevertheless, for there is a summer resort at Mariaville Lake. Several hundred campers from Schenectady are to be found in that locality during the summer, and tri-weekly dances at the lake during the summer months attract thousands of people from Schenectady and Amsterdam. In the winter there is considerable ice skating and other sports.

The lighting of this highway has facilitated its use at night by this traffic, and has militated against the accident hazard. Another advantage of the installation is that it opens a wide territory not previously served by electricity, bringing the benefits of electric light and power to farmers as well as campers and other summer residents. The representatives of the latter have been particularly active in seeking the extension of lighting and power to the section.

The annual cost of this installation, to the county, is expected to be approximately $1,000 per mile, this figure including the initial cost of construction, spread over a period of years.

The installation was made and is oprated by the New York Power and Light Corporation. The lights are the General Electric Eternalite (Form 47) type, of 4,000 lumens each, and are suspended over the roadway from mast arms attached to the poles, with a spacing of approximately 250 feet and an elevation of 23½ feet above the road surface.

Rustic Poles for Rugged Country

HIGHWAY LIGHTING IN VICINITY OF OLD FORGE, N. Y.
On two roads from this Adirondack Mountain village are 177 of these Novalux Form 25 units, with 4,000-lumen lamps, on rustic cedar poles, 120 feet apart

Why the Kewanee Park Board chose G-E floodlights for the city ball park

Illumination of Kewanee baseball park with G-E projectors

IN the spring of 1931, the City of Kewanee, Ill., instituted an *amateur* baseball league of four teams. The objects were to revive interest in the game, to add a new attraction to the public park, and to provide free evening entertainment for the citizens. "Twilight league" games are generally "called on account of darkness." Hence, it was decided to play *after dark* — on a floodlighted field.

Arthur Cook, President of the Park Board, announced: "We have decided to install lights in Northeast Park. We will put them in as soon as we can decide on the best ones to install." *G-E floodlighting equipment was chosen and installed.*

Twice each week during the summer, the ball field was thronged with fans, who made voluntary contributions to the league's expenses. No salaries were paid, as the amateur status was strictly preserved. The lighting system was designed by C. H. Youngdahl, of the Kewanee Public Service Company, with the coöperation of G-E engineers.

Professional baseball has found a big drawing card in evening games floodlighted with G-E projectors. Amateur baseball can be made equally attractive in the same way. It's an appropriate use for city parks and will prove tremendously attractive. Write the nearest G-E office for Bulletin GEA-1206A, "Light that Started Sports at Night," or ask for the recommendations of a G-E lighting specialist.

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